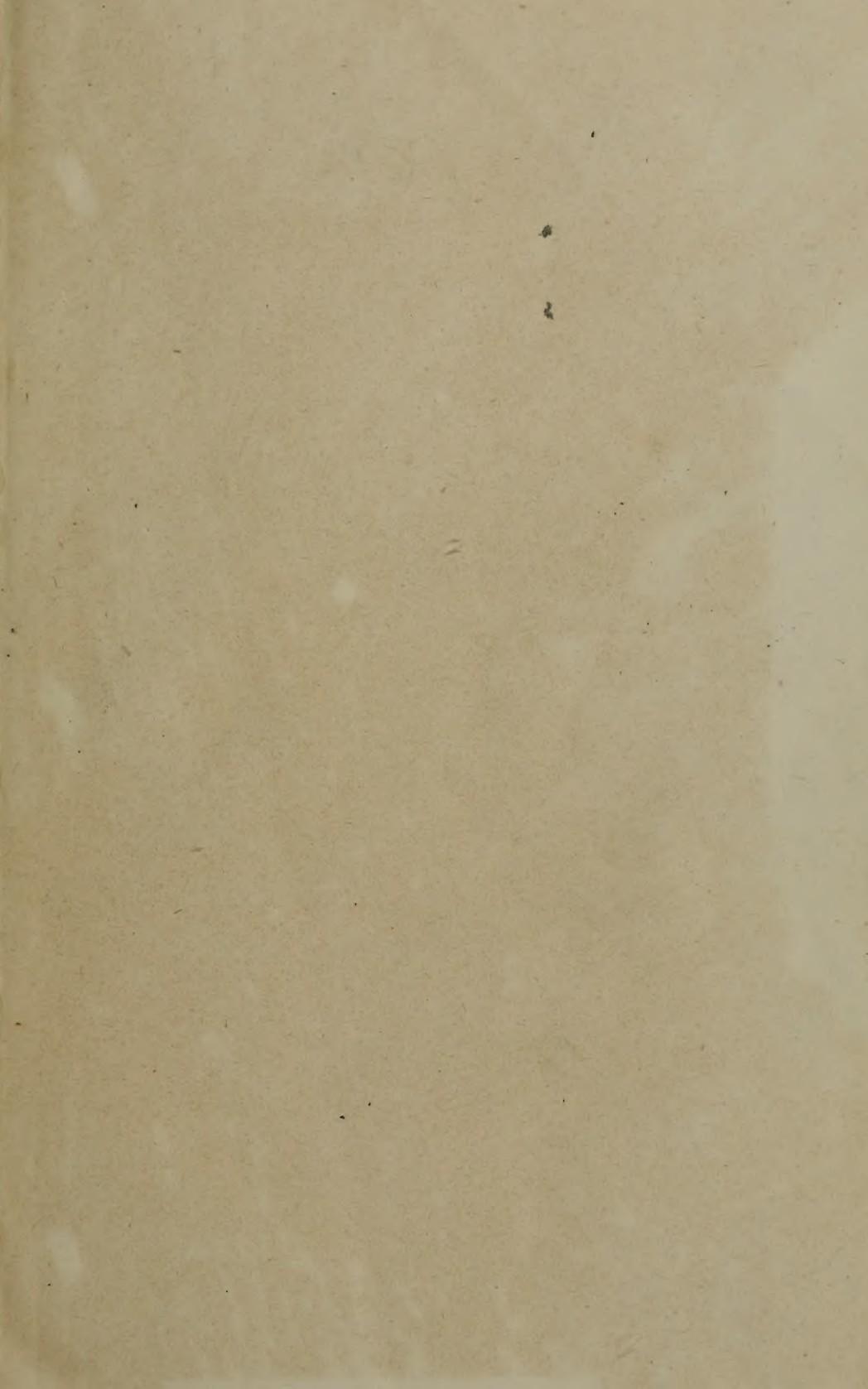
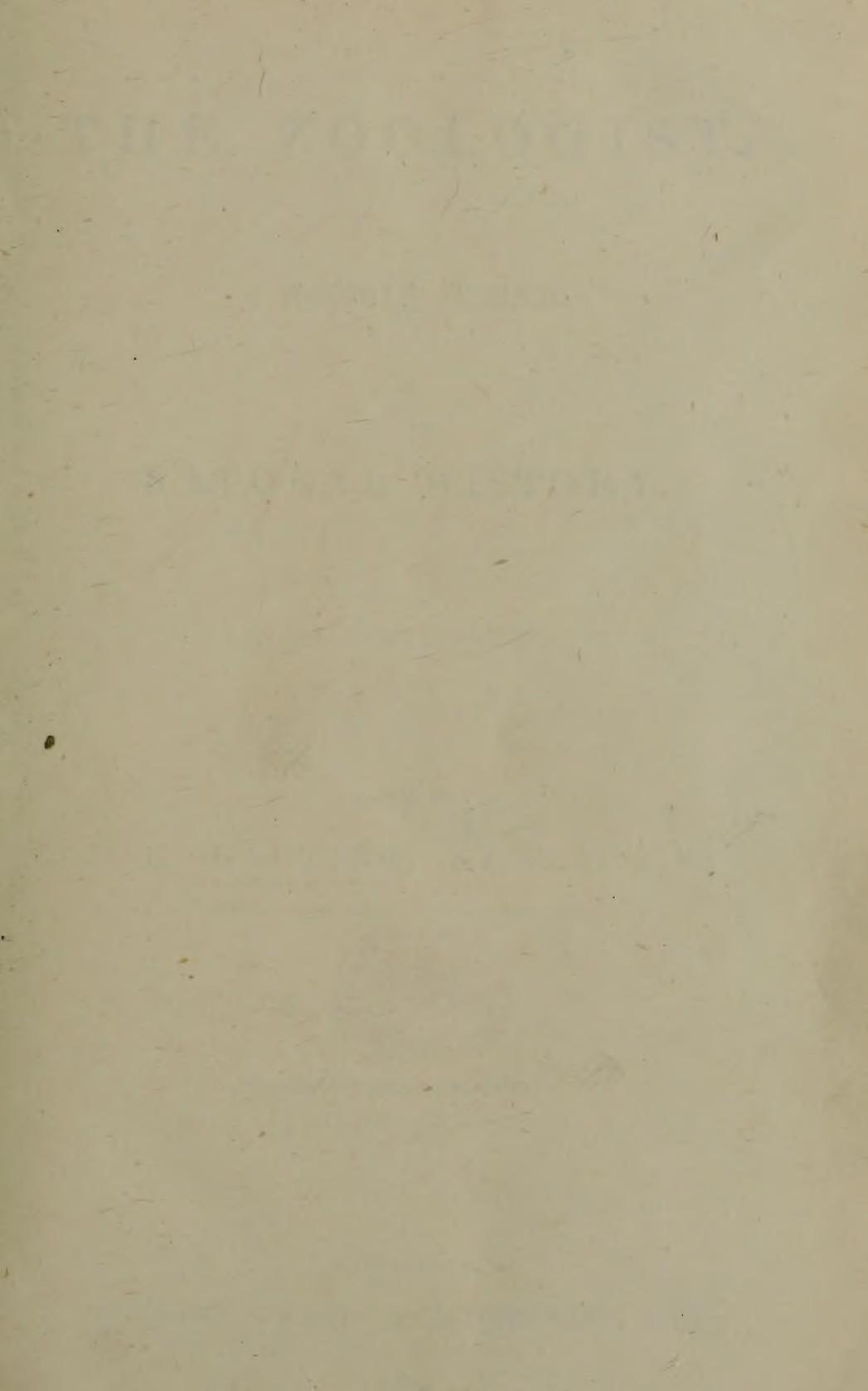




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J. E. HARTING, F.L.S., F.Z.S.,

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PREFACE.

THE completion of the present volume imposes on its Editor the pleasing duty of thanking the many friends who, by their contributions or suggestions, have so ably helped him to the performance of the task he had undertaken.

The contents speak for themselves; but the Editor cannot omit expressing his satisfaction that in quality they are not inferior to those of any volume which appeared during the long management of his lamented and experienced predecessor. The papers by Captain Feilden, "On the Mammalia of North Greenland and Grinnell Land," and by Mr. Warren, "On the Birds of the Moy Estuary," may, without disparagement of any others, be especially cited as furnishing valuable information not before published.

As in most former years, Ornithology continues to fill the greatest number of pages; but the Editor, who certainly cannot be accused of indifference to its great fascination, would yet remind his correspondents that for this journal justly to maintain its title of 'THE ZOOLOGIST,' many other groups of animals deserve

attention as well as Birds, and he trusts that in future more appreciation may be shown of their attractions than has been exhibited during the past year.

It is very gratifying, also, to find that the number of subscribers has considerably increased, for this fact testifies to the growth of the taste for, and of the study of, that branch of Natural History which it is the object of this journal to advance.

It is confidently hoped that as the present series progresses the encouragement hitherto received from both subscribers and contributors will in no degree abate.

J. E. H.

1st December, 1877.

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THE ZOOLOGIST.

THIRD SERIES.

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[No. 1.

EDITOR'S ADDRESS.

IN undertaking the duties of Editor of this long-established journal, the promises already received assure me of a continuance of the kind assistance which was so freely rendered to my predecessor by a large majority of the best zoological observers in the United Kingdom; and for my own part I shall strive to prove myself worthy of that support. It will, however, be readily understood that the success of 'THE ZOOLOGIST' depends far more on its contributors than on the exertions of its Editor, and accordingly I venture to preface my labours by a few words which I trust may be acceptable to those on whose favour I shall have so largely to rely.

In the first place, it must always be remembered that Zoology is one of the most progressive of the sciences. Consequently many zoological observations which at the time they were made—say twenty years ago—were apt enough and of great value, have since become, by the natural growth of the study, of comparatively slight importance at the present day. Nor is there any appearance of a check in this growth. On the contrary, Zoology was never more rapidly advancing, and its votaries were never more active and numerous than now. The

results no one can attempt to predict; but it is clearly the duty, as it must be the desire, of all zoologists and well-wishers to Zoology to aid this rapid advance. I would, therefore, with the utmost respect to my supporters, earnestly request them in every case to consider beforehand whether the contributions they may be intending to forward to this journal are such as will promote the progress of the study, and to satisfy themselves that this is so ere they despatch their communications.

It does not follow because a certain incident deserved publication once, that a similar incident is not worthy of record now. It is obvious that there are many occurrences which it is not only allowable but even highly desirable to communicate time after time, although beyond the mere occasional differences of place and date there may be little or no novelty in the notice.

Of such a kind are communications regarding the appearance of really uncommon species, or of common species at unusual seasons or in new localities. The use of these lies in their multitude, for it is only by collecting such records extending over a long period that any law may be deduced from them—a law which perhaps may bear upon some more general question: or the fact may be rendered apparent that the species is extending its geographical range. And it seems fitting that '*THE ZOOLOGIST*,' which has always been the great storehouse of notices of this kind, should still maintain the same character. Hereby the progress of science may be unquestionably aided.

Then there is another matter, and one which I am well aware requires delicate handling on the part of an Editor. Yet it is so important that I cannot refrain from directing attention to it, and trust I may do so without giving offence to any. There exists amongst all contributors to Natural-History journals an unconscious but more or less strong tendency (sometimes most strongly shown in the best writers) to make the local and personal part of their communications of greater importance than it deserves.

To put a case which I never heard of happening, although it might well occur :—A man fishing, entomologizing, or botanizing along a stream encounters, one after another, a dozen Kingfishers; yet perhaps for days, weeks, or even months, he may have taken almost precisely the same walk, perhaps for the same purpose, without ever having seen more than a single bird of the species in one day, and that only at rare intervals. He will record the fact, and it is worth recording, but the probability is that in so doing he will rather dwell on its personality or local character—the circumstance that he, and he alone of mortals, was so favoured as to be the witness of such an unusual sight, and that his favourite stream was the scene; and he will be tempted to relate the happy accident which led him on that particular day to start with rod, net, or vasculum on that particular excursion. The cause or causes which induced the appearance of so unusual a number of Kingfishers will be most likely passed over altogether, although herein lies the sole importance of the communication. The observer's personality is of little or no interest to any one but himself: it is the bird or the number of birds observed under such circumstances that alone can have any zoological bearing.

In like manner, by too many naturalists, is the capture of a scarce insect or mollusk in a particular locality regarded rather as an instance of the lucky captor's prowess than as having reference to the appearance of the species. Still more forcible are these considerations when the species may be, after all, one that is not rare, and one that may be safely expected to show itself in the locality at the proper season.

There is some reason to suppose that the prevalence of notices of this kind (and I think no one can assert that past volumes of '*THE ZOOLOGIST*' have been free from them) has been the means of deterring excellent observers from recording in this or other journals discoveries of considerable interest and importance. One such may perhaps be cited as having been brought to my knowledge

by a friend. About ten years since an Annelid of very remarkable character—Dutrochet's Land-leach (*Trocheta subviridis*), of which only two examples had previously been observed in England, and those under circumstances which led to the suspicion of its being an introduced species*—was found to be abundant in a particular locality. The finder was urged to publish the fact in 'THE ZOOLOGIST,' as the most appropriate means of making it known to naturalists, but he could not be persuaded to do so, from the notion, ill-grounded as it might be, that notices therein printed generally had their origin in the personal vanity of the writers; and hence the details of this interesting discovery have never yet been fully given to the world. Many of the best field-naturalists shrink from giving their observations publicity, partly that they may not incur the shadow of a charge of personal vanity, and partly through an opinion of self-respect, which hinders them from placing their own discoveries on a level with those of men against whom such a charge could be not unfairly brought.

These remarks I venture to make now; it would be impossible for me to make them later, for they might be wrongly applied by some of my readers to communications that will have appeared in the meantime. At the outset of my editorial career, however, they may be taken not amiss.

In conclusion, I need only say that my best efforts shall be devoted to the advancement of the study which all zoologists have at heart, and, with the assistance of my contributors, I doubt not that that advancement will be real.

* See Dr. Murie in the 'Proceedings of the Zoological Society,' 1865, pp. 650—662.

ON THE EUROPEAN REDPOLLS.

BY ALFRED NEWTON, M.A., F.R.S., V.-P.Z.S., &c.

HAVING on two previous occasions expressed my opinion (Zool. 2nd ser. 2223, 3880) on some matters relating to the nomenclature and distribution of the European Redpolls, I think it only right to acquaint the readers of this journal with certain results at which I have arrived after several prolonged examinations, in consultation with my friend Mr. Dresser, of a very considerable series of specimens from various localities—the more so since on a few points, and these not altogether unimportant, my views have thereby been somewhat modified. I have now come to the conclusion that we must count *four* forms of Redpoll among the birds of Europe, three of which have been obtained in the British Islands.

1. There is the real *Fringilla linaria* of Linnæus. This is the Mealy Redpoll of English authors, and seems to have the widest range of all the forms. Specimens from this country (to which it is a not infrequent winter visitant), from Lapland, Northern Russia, Japan, California, Pennsylvania, and Greenland (to which last it is only a summer visitant), cannot by any means that I know be distinguished from one another. In Part 10 of the revised (4th) edition of Yarrell's 'British Birds' (ii. pp. 133—143), I have attempted a full account of its history, under the name of *Linota linaria*. Among its numerous synonyms are *Linota borealis* and, to some extent, *L. canescens*.

2. Considerably surpassing the foregoing in size, and distinguishable besides by its very hoary plumage and deeply-forked tail is the *Linota hornemanni* of Holböll. This is a resident in Greenland, whence, many years ago, Mr. Bond, I myself and others received its nests and eggs. It would appear from a specimen in Mr. Hancock's collection to be the form of Redpoll which occurs in Iceland. It is also the bird found breeding in Spitsbergen by Mr. Eaton (Zool. 2nd ser. 3805—3808), and, under the English name of Arctic Redpoll, Mr. Hancock has figured a specimen (B. Northumb. & Durh. pl. 5, p. 54) which was obtained at Whitburn, April 24, 1855. There are grounds for believing that it has strayed in winter to the north of France, and probably indeed it occurs, though in small numbers, every winter in Scandinavia and in the northern parts of the American continent. The kindness of

Mr. Gould fortunately enables me to declare that this form is not his *L. canescens*, as was asserted by Bonaparte and Prof. Schlegel, who have been followed in their mistake by most ornithological writers. A brief notice of this Redpoll is given in my new edition of Yarrell's work before named (ii. pp. 143—145).

3. Next there is a very interesting form, not until this year recognised as an inhabitant of the Old World. This is the bird described some fifteen years ago by Dr. Coues under the name of *Ægiothus exilipes* (Proc. Ac. Nat. Sc. Philad. 1861, p. 385). Our adventurous countrymen who have lately visited the northern parts of Russia, Messrs. Alston, Harvie Brown and Seebohm, have brought thence numerous specimens of it. In the depth of winter it is nearly as hoary as the last, but its small size enables it to be easily distinguished therefrom. I have seen examples from Lapland proper, but I cannot aver that it breeds there. From Archangel eastwards to the Petchora country it must be very common. Mr. Dresser has specimens obtained in Turkestan by Dr. Severzov, and we may guess that its range extends wholly across Siberia. At any rate it appears in that part of North America which is subject to the most severe climate, and it is as an Arctic-American species that Dr. Coues described it. Meanwhile we may speak of it as *Linota exilipes*. It has not, so far as I know, been obtained in these Islands: Mr. Dresser will no doubt do it justice in his valuable work.

4. Lastly we have the peculiarly British form of Redpoll. This, though commonly called by English and some foreign authors *Linota linaria*, is, as I have often said before, not the true *linaria* of Linnæus, and its earliest specific epithet is *rufescens*, assigned by Vieillot some sixty years since (Mem. R. Accad. Sc. Torino, xxiii. Sc. Fis. p. 202). To Temminck, the inveterate antagonist of the naturalist just named, is undoubtedly due the confusion which for so long a time surrounded this charming little pet of our childhood. According to all the information I have been able to obtain and sift, it would not appear to breed anywhere but in the British Islands, and, were it not that its roving disposition sends it to southern countries in winter, it would be as emphatically peculiar to our own land as is the Red Grouse. In point of size it fairly agrees with *L. exilipes*, but *L. rufescens* is never hoary and keeps from its youth upward that rufescent colouring which prompted Vieillot to give it the appellation by which it should be known.

In a former notice (Zool. 2nd ser. 2223) I said that I believed it had been observed in the extreme south of Sweden. I now think that I was misinformed on this point, and certain it is that this form of Redpoll has not yet been found to breed in Scandinavia. What else is known of its history I have done my best to trace in the account given in the revised edition of Yarrell's 'British Birds' (ii. pp. 146—152).

I will here abstain from any generalizations from the facts I have just stated, and will only call the attention of my readers to the remarkable results at which my lamented friend Mr. John Wolley arrived with regard to the curious seasonal growth of the bill in *L. linaria*, as observed by him more than twenty years ago, and recently set forth by me in my history of that bird above referred to. Their truth was confirmed by the instinctive deduction of the late Dr. Gloger, to whose happy knack of solving an ornithological difficulty I the more readily bear witness since it was once my fate to confront and refute him on another matter. I will, in conclusion, point out that Wolley's experience of Lapland and knowledge of its birds has of late frequently met with scant appreciation. I have found his testimony set at no higher rate than that of another Englishman who having lived ten years in Sweden knew not the confines of the country, and but once, and that but for a single summer, visited one district in Lapland.

—o—

ON THE MIGRATION OF BIRDS ON THE N.E. COAST OF ENGLAND IN THE AUTUMN OF 1876.

By JOHN CORDEAUX.

THE following notes, although not so complete as I could have wished them to be, refer more especially to the arrival of autumn migrants on that part of the north-east coast lying between the Spurn Point and the estuary of the Tees during the fall of 1876. For many of them I am indebted to the letters of correspondents, some of whom, although not perhaps practical ornithologists, have yet a very considerable knowledge of our common autumn visitants, a knowledge acquired under the peculiar circumstances of their life, which is a very watchful and observant one,—the guardianship and care of lighthouses overlooking the

stormy waters of the great North Sea,—and rarely do we find a finer and more intelligent body of men than those employed in this important and trustful service.

It has long been a well-known fact that, during the period of the autumn migrations, large numbers of birds of various species immolate themselves by dashing, during the night time, when in full migratory swing, against the thick glasses which surround the lanterns of the various lighthouses on our shores, more particularly those situated on the eastern and southern coasts. I have known flocks of migrating Starlings settle in the night time on the top of a lighthouse, where they continued for a long time to keep up a continual chattering, astonished perhaps at the novelty of the situation. Numbers of small birds will often hover for hours to and fro in the blaze of light without striking the glass, like moths on a summer evening when the hall-door is open and the lamp lighted. Sometimes, too, on dark and misty nights flocks of Curlew and Whimbrel, like spirits of the lost, wail and scream round the solitary lamp-trimmer in his lonely pharos, or troops of Gray Plover and Dunlin whirl past in the blaze cast forth by highly-polished lenses—shape, size or colour as distinctly apparent in each individual bird as if seen by the light of noonday. It is a curious sight indeed for the lonely night-watcher to see the deluded little birds beating themselves to death against the polished pane, or to hear the *thump* as something heavier—Blackbird or Field-fare—strikes and is hurled back smashed and senseless into the abyss. It seems easy enough for the spectator unaccustomed to the scene, bewildered and dazed by the blaze of light within the lamp-room, to slip and pitch headlong through the glass into the same black abyss which has just swallowed up the birds; but it is years now since I spent a night in a lighthouse, and the sensation of fancying oneself pitching backwards through the glass into the darkness requires some imagination to recall it.

Often have I wished that it were possible for a thoroughly practical ornithologist to be placed, for three months in the autumn, in each lighthouse and lightship; his work to consist of filling up, in a tabulated form, a record of birds striking the glass at night; the number of each species, sex and age, direction of flight, hour, state of weather and wind. These tables, taken collectively, would be deeply interesting, and perhaps throw light on some of the yet little-understood problems of migration.

It is rarely, if ever, that sea birds strike the glasses ; they are perhaps too much accustomed to see the lights, and we find, as a rule, that they migrate far out at sea. Shore birds, again, do not so frequently come to grief as the true land birds ; they are accustomed to the shore and the neighbourhood of lighthouses, and are also partly crepuscular in their habits. In nine out of ten cases it is the true land bird that suffers from these collisions—such as under normal circumstances go to roost at a reasonable and early hour, and are on the wing again at the first flush of dawn ; they are unaccustomed to the darkness, more apt to be bewildered by late hours and the glare of lamps, and have little experience of night travelling, for the dark night migration takes place but once a year.

Eagle.—An Eagle, probably *Haliæetus albicilla*, was seen during the third week in November about the coast near Seaton Carew, Durham : it succeeded in avoiding the attentions of the numerous coast gunners, and finally took its leave after a few days' sojourn in the neighbourhood.

Osprey.—Mr. Richardson, of Beverley, informs me that he has received for preservation a male Osprey, apparently a bird of the second year. It was shot on the 23rd of November, at Cherry Burton, near Beverley. Mr. Adrian, of Lincoln, told me of another obtained this autumn in South Lincolnshire, but I neglected at the time to make a note of the date and locality.

Peregrine Falcon.—Mr. Bailey, of Flamborough, has recently seen three or four about the headland. Flamborough Head appears to be a very favourite locality for this species.

Short-eared Owl.—These birds arrived on the night of the 23rd October ; at least, I first found them on the morning of the 24th, crouched amid patches of rough sea-grass on the embankment, as well as further inland on drain-sides and amidst rough grass in pastures. In the latter places they are comparatively safe. Unfortunately those alighting on the coast are almost invariably potted by the first loafer who at break of day, with rusty fowling-piece and villainous cur at heel, strolls along the sea embankment ; for the poor soft-winged slow-flying Owl offers an easy mark, and will sit till nearly trodden upon. This autumn unprecedented numbers came, and I have heard of them in many localities on this coast. It is astonishing any are left to migrate, considering the number, year after year, wantonly and cruelly destroyed on their first arrival, as well as the many which figure afterwards amongst the "sundries"

of the autumn and winter shootings. Mr. Lewis, the Principal of the Spurn Lighthouse, says he has never known them strike the glass like other birds, but during the period of migration they will fly round and round the lantern, apparently not incommoded by the blaze of light, and take off small birds that are fluttering and beating themselves to death against the glass. They arrived off Flamborough in flocks of from ten to twenty. The Principal has never known them strike the glass, but has twice observed them perched on the gallery rail on the outside of the lantern. North of Flamborough they appear to have been equally numerous along the coast. On a rock close to the Hartlepool Lighthouse a fisherman early one morning in October saw eleven or more sitting together. In a letter lately received from Heligoland, Mr. Gätke says:—“The Shorteared Owls pick off the poor birds when they are dazzled by the glare of the lighthouse, but not those fluttering against the glass; but Thrushes on the wing—constantly one hears their dying cries when clutched by the nude talons of an Owl that had just flitted, like a phantom, noiselessly past the light.” A friend writing from the Durham coast (November 23rd) says, “During the last bad weather our shores were thickly visited by the Woodcock or Shorteared Owl; there have not been so many for some years.”

Great Gray Shrike.—Mr. Boyes informs me by letter that he saw this bird at Spurn on the 23rd of October. Early in the morning of the 24th he saw another sitting on a hedge-top near Kilnsea: this he shot; it proved an immature male. Later in the day he saw another at Spurn, which seemed a fine old bird: Mr. Boyes shot this also, but did not recover it, as it managed to conceal itself amongst the long grass. Mr. Boyes mentions ten others shot a day or two previously to his visit. Mr. Lewis also shot one about the same time; but this bird also, like the one Mr. Boyes shot, succeeded in concealing itself in the long sea-grass. In ‘The Field’ for November 18th a bird of this species is recorded as shot at Sproatley, Holderness, during the first week in November. The Great Gray Shrike may be considered a very regular immigrant to our Holderness and North Lincolnshire coast at this season. In the Lincolnshire marshes it is common enough to have a local name, “Mutterer,” a name I conclude given from its note, which, as I have heard it, resembles the knocking of two pebbles together.

Redwing.—I saw the first here on the 8th of November. Curiously enough, the only three birds killed against the Whitby High Lights in October, were two Redwings and a Lark.

Fieldfare.—I saw the first here on the 9th of November, two or three only; on the 15th many, but all birds of the year.

Blackbirds.—Came in, as usual, in large numbers, the bulk of them about the 16th and 17th of October, also up to the end of the month and in November.

Ring Ouzel.—These birds were seen at Spurn, as Mr. Lewis informs me, about the 16th and 17th of October, when the large body of Blackbirds came. I have usually met with them sparingly in these marshes, and in some autumns, at the time the other *Turdidae* arrive, very rarely, however, coming across an adult bird—the majority are young of both sexes and females: * these are often difficult to distinguish amongst a hedgeful of Blackbirds, except by their grayer look and notes. Others, old birds, arrived at Spurn about the 28th of October—"old birds in full plumage," as Mr. Lewis says, "but not many." At the Flamborough Head Light, on the 30th of October, wind S.W., overcast, Starlings, Blackbirds, Ring Ouzels and Fieldfares came against the glasses. As a rule, the Starlings arrive a week before the *Turdidae*. In Heligoland, Mr. Gätke says, "The Ring Ouzels came during the end of the month of October, which is four weeks too late for them here. There has been general disorder this year amongst the migrants." I have no notice of any Ring Ouzels north of Flamborough Head.

Golden-crested Wren.—I saw the first Goldcrests here on the 23rd of October. At Spurn they arrived about the 16th and 17th. At Flamborough, on October 20th, one pair of Golden-crested Wrens, male and female, accompanied by one Fire-crested Wren, † a male, struck the glass of the lighthouse between ten and eleven o'clock at night; weather very cold and much rain; wind S.E. At the Hartlepool Lighthouse the most frequent bird coming against

* Dr. Saxby ('Birds of Shetland,' p. 65) says, "In autumn we are generally visited by females, each accompanied by two or more young birds."

† I have not seen this bird: my informant, the Principal of the lighthouse, may have been mistaken. So-called Fire-crests captured on this coast I have invariably found to be old male Gold-crests. Professor Newton, in the new edition of Yarrell's 'British Birds' (vol. i., p. 459), points out the most obvious distinction between the two species: writing of the Fire-crested Wren, he says, "The black streak in which the eye is placed is the character by which this species can be more readily distinguished from the Golden-crested Wren."

the glass in October was this species; wind blowing fresh from the N.E. and S.E.; direction of flight always westerly.

Snow Bunting.—The only Snow Bunting I have seen so far in our marshes was on the 27th of November—a single bird coming across the river from the direction of Spurn. Others were seen in small parties at Spurn, November 16th; and a correspondent, writing from Flamborough (November 22nd), says a flock had been seen on the headland all the week, in company with Larks. Last autumn when the Snow Buntings arrived at Flamborough they were accompanied by Crossbills, a gale from the N.E. blowing at the time, and very cold weather. Just seven years previously my informant had seen Crossbills and Snow Buntings mixed together flying across Lundy Island, and shot examples of both. This was November 22nd or 23rd; sky overcast, wind westerly, and very warm. Mr. W. Lewis, writing from Spurn, says, "This morning (November 24th), in my watch from 3 A.M., there have been great numbers round the lantern; wind S., moderate. A few Gray Plover struck; also Dunlin, Blackbirds and Larks."

Woodcock.—There was a large flight of Woodcocks at Spurn on the morning of October 28th; wind N.E., light and misty. Unusual numbers appear to have landed on our N.E. coast about this date. Others came against the glasses of the Hartlepool Lighthouse, at the same time, and under the same circumstances, as the Golden-crested Wrens.

Snipe.—The first flight came on the night of October 24th; the main body, undoubtedly, during the severe weather of the 8th and 9th of November. On the latter morning I saw many small parties of two, three and six (but not exceeding the latter number), crossing the marshes from N.N.E. to S. and S.W. Saw the first Jack Snipe the same morning. Mr. Bailey, of Flamborough, had in October two Common Sandpipers killed against the glass of the lighthouse, and another which he calls Schinz's Sandpiper (?), also killed against the light. Perhaps we shall hear more of this last bird.

Swan.—On the 16th and 17th of October six were seen at Spurn; also a great many Ducks; wind S.E., moderate. Mr. Bailey, of Flamborough, says they have had numbers of Ducks along the coast.

Little Gull.—Two immature birds, now in the possession of a friend, were shot by Mr. Bailey off Flamborough Head in

September. A mature Glaucous Gull was seen, and an immature one shot. There were great numbers of Manx Shearwaters off the headland during August and September, and Mr. Bailey has seen one Great Shearwater.

As a sequel, I will give, from the other side of the North Sea, a page from Mr. Gätke's note-book, showing the migration of birds across Heligoland during the last fortnight in October, 1876.

" Oct. 1876.—16th, 17th, 18th, 19th. East, very strong. *C. Cornix*, thousands; *Sturnus*, hundreds; *Buteo*, many; *Lagopus*, some; *Musicus*, abundant. These passed the island night and day.

20th. East, very strong. *Cornix*, thousands; *Buteo*, *Lagopus*, *Nisus*, very many; *Sturnus*, a great many; *Cælebs*, thousands; *Montifringilla*, a great many; *Musicus*, many; *Iliacus*, some; *Excubitor*, two; *P. major* and *cæruleus*, some; *Anthus cervinus*, one.

21st. East, very strong. *C. glandarius*, thousands passing the island, some landed caught—coming, never ending; *Cælebs*, countless; *Montifringilla*, a great many; *Musicus*, many; *Iliacus*, less; *Major* and *Cæruleus*, some; *Nisus*, some.

22nd, 23rd. East, strong. *Glandarius*, a great many still; *Nisus*, some; *C. palumbus*, daily some; *A. alpestris*, many.

24th. *Phylloscopus* (?), seen in garden—rust-colour.

26th. W.S.W., calm. *S. rubecula*, thousands; *Rufa*, some; *Superciliosa*, one in my garden.

27th. W., calm.—28th (N.W.) and 29th (W.), little breeze. *T. torquatus* (!!!) and *iliacus*, some; *Anthus Richardi*, one; *Scolopax*, a few; *Accentor modularis*, still some; *Anas mollissima*, two fine old males shot on 27th.

30th and 31st. N.W., storm, hail and rain. *Scolopax rusticola*, 10—12; *T. pilaris*, a great many; *Strix flammea*, about 10—12 during the month; *Otus*, repeatedly; *Brachyotus*, a great many.

November, first week. Thousands of Geese, Ducks, and Swans."

Mr. Gätke, writing on the 20th of November, says:—"Immense flocks of Jays have recently passed this island, a species that numbers amongst the rarest of Heligoland; and another, still rarer, is just now shot here for the first time—viz., a *Magpie*! A friend, on hearing this, writes, 'One would think the knowing bird had heard its *Ornis* was at last going to be published, and had made its appearance accordingly, that it might not be left out!'"

ON THE OCCURRENCE FOR THE FIRST TIME IN
ENGLAND OF THE AMERICAN RED-BREASTED
THRUSH (*TURDUS MIGRATORIUS*).

BY THE EDITOR.

IT is not a little remarkable that most of the specimens of North American birds which are recorded to have been found in Europe were taken in England. According to Professor Spencer Baird this has happened in fifty out of sixty-nine instances, and in nearly every case these specimens belonged to species which are abundant during summer in New England and the Eastern Provinces of British America. This computation, however, was made ten years ago,* since which time the increased attention paid to Ornithology has resulted in the detection in Great Britain of several North American birds which had not been previously observed here, as well as many fresh instances of the appearance of species which had been already noted as occasional visitants to this country.

On referring to my 'Handbook of British Birds' (Introd. pp. x., xi.), I find that I had noted at the date of its publication, in 1872, the reported occurrence in the British Islands of 212 North American birds belonging to 42 different species. Omitting a few of these which have proved to be of doubtful authenticity, but adding some that I had overlooked, and a few others that have since occurred, we have in round numbers about 220 instances of the occasional appearance in Great Britain of North American birds. Of the forty-two species above referred to, five have been birds of prey, fourteen *Passeres* and *Picarie*, one *Columba*, fourteen *Grallatores*, and eight *Natatores*.

I have now to add another to the list of passerine birds, in the shape of the American Migratory Thrush (*Turdus migratorius*), familiarly known as the American Robin.

In the month of September last I received a letter from Lieut. Charles Pope, of the 24th Regt., then stationed at Dover, in which he informed me that a friend of his had in his possession, alive, a remarkably coloured Thrush which he was unable to identify. It had been observed to fly in from the sea in a very exhausted state

* See "The Distribution and Migrations of North American Birds," by Spencer F. Baird, in the 'American Journal of Science and Arts' (vol. xli., January, March, and May, 1866). Reprinted in 'The Ibis,' 1867, pp. 257—293.

on a wet windy day during the previous month of April (or May, he was not sure which), and perching upon the first resting-place which presented itself, the balcony of a house facing the sea at Dover, had suffered itself to be frightened in through an open window and eventually caught. It lived in a small wicker-cage from April until September, when I first heard of it, and although the plumage became much soiled by confinement, it remained in good health.

From a description and sketch which Lieut. Pope forwarded, I had no doubt from the first that the bird was the North American Red-breasted Thrush, but it was not until two months later that I was enabled to pronounce with certainty upon the species. Being unable to refer to any of the works on American Ornithology to which I had referred him, Lieut. Pope prevailed upon his friend to forward the bird to me in London, and I duly received it on the 6th November last. My surmise was correct: it was undoubtedly *Turdus migratorius*.

With the Secretary's permission, I at once placed it in the Western Aviary in the Zoological Society's Gardens, where it may still be seen in good health, and in much improved plumage.

Now, how did this bird get to Dover? On my mentioning the circumstances of its capture to Mr. A. D. Bartlett, whose long experience as Superintendent of the Zoological Society's Gardens gives weight to his opinion in such matters, he was inclined to believe that it had escaped from some homeward-bound vessel in the Channel, and had made for the nearest land; a view which he thought was strengthened by the fact that the bird when he received it was very tame.

In this I do not quite concur, for I imagine that most homeward-bound vessels from New York return to Liverpool, and not *via* Dover; while the bird's tameness is easily accounted for by the fact that when Mr. Bartlett received it into his care it had already been in captivity for about six months. I am thus disposed to regard this as a genuine case of involuntary immigration.

Many such cases are already on record, and although this particular species is not known with certainty to have occurred here before, it has been met with on more than one occasion on the European continent, and, from its migratory habits, is just one of those birds which one would naturally expect now and then to arrive.

To account for the appearance of North American birds in this country is not so easy. I was at one time inclined to believe that the majority of them must find their way here from Greenland *via* Iceland,* but the investigations of Professor Spencer Baird have led me to alter this opinion, and to concur for the present in his own view that their appearance here is due principally, if not entirely, to the agency of the winds at the period of their migrations. Prof. Baird's remarks on this subject are so extremely interesting and at the same time so instructive, that they may be here appropriately quoted. After some pertinent observations on zoological geography and the general principles of distribution to which he has been led by an examination of the large collection of specimens in the Museum of the Smithsonian Institution, he proceeds to deal in detail with the migration of North American birds, and referring to the species which are reported to have occurred in England, he says:—

" Birds of North America rarely, if ever, reach England from Greenland by direct spontaneous migration by way of Iceland, as shown by the fact that only three of the American birds occurring in Greenland are found in Iceland, and that few of the American species observed in Europe are found in Greenland at all. Most specimens of American birds recorded as found in Europe were taken in England (about fifty out of sixty-nine), some of them in Heligoland, very few on the Continent (land-birds in only five instances). In nearly all cases these specimens belonged to species abundant during summer in New England and the Eastern Provinces of British America. In a great majority of cases the occurrence of American birds in England, Heligoland, and the Bermudas has been in the autumnal months. The clue to these peculiarities attending the interchange of species of the two continents will be found in the study of the laws of the winds of the northern hemisphere, as developed by Prof. Henry and Prof. Coffin. These gentlemen have shown that 'the resultant motion of the surface atmosphere, between latitudes 32° and 58° in North America, is from the west, the belt being twenty degrees wide, and its greatest intensity in the latitude of 45° . This, however, must oscillate north and south at different seasons of the year with the varying declination of the sun. South of this belt, in Georgia, Louisiana, &c., the country is influenced, at certain seasons of the year, by the north-east trade winds, and north of the same belt by the polar winds, which, on account of the rotation of the earth, tend to take a direction

* In support of this view, it may be observed that out of the forty-two species of North American birds which are stated to have occurred in this country, sixteen, on the authority of Professor Reinhardt, have been found in Greenland.

toward the west. It must be recollect that the westerly direction of the belt here spoken of is principally the resultant of the south-westerly and north-westerly winds alternately predominating during the year.*

"From these considerations and facts, therefore, we are entitled to conclude that the transfer of American birds to Europe, is principally, if not entirely, by the agency of the winds, in seizing them during the period of their migration (the autumnal especially), when they follow the coast, or cross its curves, often at a considerable distance from land, or a great height above it. Carried off, away out to sea, mainly from about the latitude of 45° (the line of greatest intensity of the winds), the first land they can make is that of England, whence the fact that most of the species have occurred in the British Islands as well as Heligoland, equally well fitted to attract stragglers and furnish them a resting-place."

In view of these observations from so competent an authority, it is not unlikely that the bird which forms the subject of this notice may have found its way to this country without the agency of man, and if this be so it deserves to be placed in the annually increasing catalogue of "Rarer British Birds."

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OCCASIONAL NOTES.

AUTUMNAL BREEDING OF THE OTTER.—On the 5th of December I happened to be in Mr. Vingoe's laboratory, where I saw a young Otter, about the size of a Fitch, or Polecat, which had been brought in from an adjacent valley, where it was seen and knocked on the head. I was not aware that the Otter bred in the autumnal months, as well as in the spring, when we know they do breed.—EDWARD HEARLE RODD (Penzance).

[The time of breeding with the Otter seems to be quite uncertain, young ones being found at very different seasons of the year. Mr. Bell, in the 2nd edition of his 'British Quadrupeds,' p. 176, says, "The female goes with young nine weeks, and produces from three to five young ones in March or April." The Rev. Leonard Jenyns says (Brit. Vert. An. p. 13) it breeds in March. Mr. Harris, of Moorswater, Liskeard, Cornwall, informed us some time since that he had taken young on the 3rd of April, "not much larger than mice, but covered with hair, and able to swim." Isaac Walton, who, from being constantly on the river, ought to have known something about Otters, speaks of discovering a female Otter, with five young ones, in May ('Complete Angler,' Major's 4th edition, p. 50).]

* See Prof. Henry's articles on Meteorology, 'Report of Commissioner of Patents for 1856,' p. 489.

A pair which were formerly in the Zoological Society's Gardens, bred in August (see 'Zoologist,' p. 1901). Three young ones taken in Norfolk in January were about six or eight weeks old, and therefore born in November ('Zoologist,' 1851, p. 3022). A well-known sportsman and naturalist, the late Mr. Lloyd, of Scandinavian renown, informed us that in Sweden the Otter pairs in February or March, according to the mildness or severity of the season. The latest contribution that we have seen to the natural history of the Otter, and a very instructive article withal, is from the pen of Mr. Thomas Southwell, of Norwich, and may be found in the 'Transactions of the Norfolk and Norwich Naturalists' Society,' 1872—73 pp. 79—90. On page 84 a tabular statement is given, showing the various periods of the year in which, in fourteen instances within the writer's knowledge, young Otters have been found in Norfolk. The result of Mr. Southwell's experience is that the Otter produces her young ones from December to February, is not double-brooded, and that the number of young is from one to three, rarely exceeding the latter.—ED.]

RABBITS BREEDING ABOVE GROUND.—In the last edition of 'Bell's British Quadrupeds' it is stated (p. 344) that "on moors where the soil is very wet, Rabbits often refrain from burrowing, and content themselves with runs and galleries formed in the long and matted heather and herbage." An instance has recently come under my notice in which a Rabbit was found breeding above ground in a field of turnips, and in a flat form, like that of a hare. The form contained four newly born young, and before they were discovered the old doe was unfortunately shot. This was near Amesbury, in Wiltshire, and the circumstance was reported by an eye-witness, Mr. W. Southam, in 'The Field' of the 2nd December last.—
J. E. HARTING.

OCCURRENCE OF A SOUTH AMERICAN RAIL IN WILTSHIRE.—On the 20th of October last I received a communication from my friend the Rev. Arthur Morres, vicar of Britford, near Salisbury (an ardent and an accurate ornithologist, on whose judgment I knew I could rely), giving me particulars of a strange bird (which he had seen in the flesh in the shop of Mr. Foot, birdstuffer, at Bath, on the previous Tuesday) which he could not identify, and upon which he asked my opinion: at the same time he enclosed a small feather, to show the prevailing colour of the plumage. It had been shot on the western borders of the county, between Trowbridge and Bradford, and had been taken to Mr. Foot for preservation on Saturday, October 14th. From the description given it was evidently a Rail, very like a Moorhen in shape, and was generally of a bright chestnut colour, with crimson legs. It measured fifteen inches and a half in length, and the beak from tip to gape was two inches. But I cannot do better than quote Mr. Morres' own description, of the excellence of which Professor Newton subsequently expressed his unqualified approval:—"Legs and

irides bright crimson lake; beak light green, yellowish at the base; it had no naked patch or shield on the forehead (possibly from its immature age); head and neck, gray; back, light olive-green; tail and tail-coverts, black; breast, bright chestnut-brown; wings, bright brown, especially the quills, which had almost a crimson tinge to them; wings, underneath, barred with black and rufous-brown (one of these feathers was enclosed); thighs, gray; vent, &c., black." Being utterly at a loss to name the bird in question, and feeling very certain that it was no European species, I sent Mr. Morres' note and the single feather to my friend Professor Newton; and here I beg to hail, as a triumph of practical Ornithology, the fact that no sooner did Mr. Salvin, who examined it with Professor Newton, see the feather and hear the description, than he at once pronounced the bird in question to be the American species, known as *Aramides Cayennensis*; a judgment which the two able ornithologists above named immediately verified by comparison with other specimens in the Swainson collection at Cambridge. Professor Newton adds that "as its name implies, the bird is an inhabitant of Cayenne and adjoining parts, occurring in Trinidad, but nowhere nearer (he thinks) to this country. It has been brought over several times to the Zoological Gardens, but it is most improbable that it should find its way to England unassisted; though, supposing it had made good its escape from confinement, it might perhaps continue to exist for some weeks, or even months, here, except in winter. *Aramides* is a rather aberrant genus of Rails, found only in the New World." Doubtless Mr. Morres and I should have been better pleased if we could have honestly considered our Wiltshire visitor as "veritable British," but after this decided opinion of Professor Newton we shall scarcely be disposed to regard the stranger as a voluntary visitor, or as one of the numerous stragglers driven over by adverse winds; we must rather look upon it as an escaped prisoner, perhaps one which has freed itself from captivity for some time, and has been wandering on and skulking from observation, after the manner of other two-legged creatures when they have managed to get outside the prison bars. I am bound, however, to say that Mr. Morres, who has made enquiry in the neighbourhood, can hear of no such escape, and says there are no marks of captivity about the bird. I may also remark that it is so far a cosmopolite as to have bred in the Jardin d'Acclimatation at Paris ('Ibis,' 3rd Series, vol. i., p. 435), and I may remind Professor Newton that in the second series of the 'Ibis,' of which he was the talented editor (vol. iv., p. 486), he speaks of this very species as "the wide ranging *Aramides Cayennensis*."—ALFRED C. SMITH (Yatesbury Rectory, Calne).

GREENFINCH NESTING IN FURZE (Zool. 2nd ser. 5120).—In the summer of 1875 I found several nests of the Greenfinch in some tall furze bushes situated outside the wall of a kitchen garden, and one nest—containing four young ones—was almost entirely constructed of the silky catkins of

the swallow, which the parent birds must have brought from some considerable distance, as no sallows are growing near the spot. The materials of which this nest was composed made it very conspicuous, and, what is more remarkable, the bird must have built it at a time when workmen were erecting an orchard house within a few yards of the bush; but we well know that birds as a rule are much tamer, so to speak, during nidification, than they are at any other time. I may remark that although these nests were built in the furze *outside* the garden, yet a much larger number were to be found *within* its boundaries, and these were constructed in almost any suitable place. The furze dwellers had possibly found the locality favourable for food, but not wishing, or not being allowed, to inconvenience their neighbours by building in their midst, they had availed themselves of the nearest suitable situation. I have never found a Greenfinch's nest in the furze upon the open heath, as I have those of the Linnet, and think the Greenfinch generally chooses a higher situation for its nest than the Linnet. As I had frequent opportunities of observing the Greenfinches in question, I may throw some little light upon "the time of day at which birds lay their eggs" (Zool. 2nd ser. 5115, 5161), and I can quite believe that the late Dr. Saxby intended writing A.M. and not P.M. These greenfinches always laid, as far as I was able to observe, in the morning, between 7 and 12 o'clock, generally from 8 to 10. When a boy at school I well recollect finding the nest of a Goldfinch in a high hedge: it had previously been found by some of my school-mates, and each was anxious to obtain the first egg. Two or three consecutive mornings I rose soon after day-break, in anticipation of becoming the possessor of the much-coveted prize, ignorantly supposing that the bird laid during the night, or at very early morning. On the fourth morning an egg was laid between eight and nine o'clock, after I had waited some four or five hours for its appearance; I took this egg, and on the following morning the bird laid another about the same time, but she forsook the nest after the second egg was taken. One evening, in my rambles about the meadows, I came across the nest of a Reed Bunting containing two eggs; the following morning, having to pass near the nest, and seeing a Cuckoo fly out somewhere near the spot, curiosity led me to look at the nest again, and I found that besides the two eggs of the previous evening, one of the Cuckoo's was therein. This was before ten o'clock, so I reasonably conjecture that the Cuckoo must have laid that morning.—G. B. CORBIN (Ringwood, Hants).

GREGARIOUS HABITS OF THE LONGEARED OWL.—I may add my mite to the observations of Messrs. Boyes and Gurney upon this subject (Zool. 2nd ser. 5163) as follows:—A few seasons ago, during March, I visited the heaths in this neighbourhood for the capture of the moth called *Pachycnemia hippocastanaria*, and in a fir-wood through which I passed I had seen one or more of the Owls in question on several occasions. One evening in

particular I recollect seeing five or six, and these flew in a moth-like fashion out upon the heath and back again to the fir-trees, keeping in a body, and often uttering a short sharp chirp or whistle, something after the fashion of the Nightjar. I laid quietly behind a bank and watched their movements, and as their excursions were made in a westerly direction—between myself and the fast-retiring sun—I could see them very plainly skimming about, sometimes just over the heather, then settling down, or chasing each other as if in play, after which they would return to the wood and settle on some low fir branch near to me, so that I could almost reach them with my hand. It seemed to me that they were birds belonging to the same nest, as they appeared uncommonly tame, but I had not heard that any Owl had nested in the wood where these frequented. Strange to say I have seen the Shorteared Owl but twice in this neighbourhood, while the longeared species is much oftener observed. It may often be seen during the winter months gibbeted in the "gamekeepers' museum," for it must be understood that here, as in most other places, all Owls are classed as "vermin," and pay the penalty accordingly.—G. B. CORBIN.

ROOKS ATTACKING ACORNS.—Whilst spending a few weeks in West Sussex during the past autumn, I was much amused in watching the way in which the Rooks carried off the acorns from an oak in front of our windows. Not content with picking up those which had fallen upon the grass below, they alighted upon the extremity of the branches, and plucking off the growing ones, carried them away to a little distance, and attacked them at leisure. I remarked that they did not swallow them whole, as Wood Pigeons do, but pecked them to pieces on the ground. Whether they swallowed the fragments, or only broke them to get at a grub within, I could not ascertain without shooting some of them, which I was loth to do; but I am inclined to think that a worm was the attraction, for after the birds had decamped I picked up handfuls of damaged and broken acorns, many of them only slightly chipped, which I should hardly have found if the birds had been feeding on them. This habit does not seem to have been noticed by the authorities on British birds, and I have looked in vain for any mention of it in the pages of Bewick, Montagu, Selby, Macgillivray, and Yarrell. It is true that Macgillivray includes acorns amongst the food of the Rook, but mentions them in such a way as rather to suggest that it is the fallen acorns which are picked up. In Jesse's 'Gleanings,' however (1st series, p. 61), I find the following statement:—"Rooks are known to bury acorns, and I believe walnuts also, as I have observed them taking ripe walnuts from a tree and returning to it before they could have had time to break them and eat the contents. Indeed, when we consider how hard the shell of a walnut is, it is not easy to guess how the Rook contrives to break it. May they not, by first burying them, soften the shell, and afterwards return to feed upon them?" It is a little curious that

Yarrell, who has given an extract from the very next page of this volume of the 'Gleanings,' should have omitted to notice this particular passage. Since writing this note I have received a confirmatory account from Mr. John Tyacke, of Constantine, Cornwall, who writes, "For the last two years I have noticed what I never saw before, *i. e.*, that the Rooks pitch in great numbers on the oak trees, and feed on the acorns, and I have been informed by a friend that they do the same on the *Ilex*." With regard to walnuts, I may add that in Sussex we have two walnut trees close to the house, and in the autumn, before the pods get too hard, the Rooks come early in the morning and steal quantities of them.—J. E. HARTING.

THE HAWFINCH (*Coccothraustes vulgaris*) IN SCOTLAND.—I wish to correct as soon as possible a somewhat grave error made by me in the last part (10) of the revised edition of Yarrell's 'British Birds,' and in so doing I have to thank a correspondent, before unknown to me, who has been kind enough to call my attention thereto. In the account of the distribution of the Hawfinch in Scotland (*op. cit.* vol. ii., p. 102, line 4) after the words, "according to Mr. Gray," the sentence should run "from Dumfreisshire to East Lothian, and thence to Perthshire," &c., and the foot-note at the bottom should be omitted. I shall endeavour to issue, with the next part of the work, a leaf that can be substituted for that which at present contains the mis-statements I desire now to rectify.—ALFRED NEWTON (Magdalene College, Cambridge, December 2, 1876).

ON THE OCCURRENCE AT MALTA OF THE SNOW BUNTING (*Plectrophanes nivalis*).—In what I said (Yarrell, Brit. Birds, Ed. 4, ii., p. 8) as to the supposed appearance of the Snow Bunting at Malta in 1840, I am still, I believe, so far correct; but Captain Feilden has kindly pointed out to me that I overlooked an undoubted instance of the occurrence of this species in that island recorded ('Ibis,' 1870, p. 490) by Mr. C. A. Wright, who shot a male bird there November 13th, 1869.—ID.

VARIETIES OF STARLING AND BLACKBIRD.—In 'The Zoologist' for October (2nd ser. 5120) a white Starling is recorded, and this is followed by an editorial note to the effect that this species "appears to be more subject to albinism than most birds." I have known three or four such examples to have been obtained in this part of Hampshire during my ornithological experience, although I have never had the good fortune to meet with one myself. I recollect a few seasons ago seeing a case of stuffed Starlings in the possession of the late Mr. J. T. Turner; it contained four birds, one *white*, one *pied*, one *black*, and one of the normal type, and, if I remember correctly, all were killed in different parts of the New Forest. In 1874 I saw a peculiarly marked specimen which had been killed near here. Its head and neck were of an uniform pale yellowish gray, whilst the rest of the body was of the usual colour and markings, except the legs, which were much lighter. I do not know if this specimen was preserved,

but I believe not. It may be recollect that in the volume of 'The Zoolologist' for 1875 (2nd ser. 4692) I mentioned the fact that most of the pied Blackbirds I had seen had more white about the head than upon any other part of the body, and this observation was confirmed by Mr. Gurney (Zool. 2nd ser. 4869). Recently, however, I have seen two specimens which proved the rule by forming the exception. One of these had a white tail, and a few pale feathers upon its back, and, as far as I know, is still alive, not far from the forest, where I have seen it once or twice in my rambles. The other specimen was killed by a boy with a stone, at Mudeford, near Christchurch, on the 16th of September. He had seen it many times bathing on the sea-shore, and although sought after by several persons for a week or two previously, it escaped till the date I have named. This specimen had the upper part of the back, wing coverts, and a band across the belly white, giving it almost the appearance of having a white belt round the body. There were a few pale feathers about the neck, and at the base of the tail, but very little white about the head.—G. B. CORBIN.

ORNITHOLOGICAL NOTES FROM THE ISLE OF WIGHT.—On the 19th of September both Swallows and Martins, mostly immature birds, were observed to be congregating in considerable numbers, seemingly about to migrate. By the 20th of October there was a general move, and few were to be seen after the 25th, and none after the 4th of November. I have been informed by Mr. Careless, naturalist, of Sea View, that he has had a handsome male Roughlegged Buzzard sent him for preservation, which was captured on the 13th of October, at Pelham Lodge, Ryde. It entered by an open window, and was found to be in poor condition; it had sustained an injury in the leg, and died the following day. Length, twenty-two inches; extent of wings, forty-eight inches. Mr. Smith, writing on the 8th November, tells me that he has had seven Short-eared Owls brought to him in a fortnight, and that he usually gets some at the autumnal migration. Few Kestrels remain with us during the winter, but one was seen on the 25th of October, in a six mile walk on the Downs. In reply to the editorial queries (Zool. 2nd ser. 5160) as to when, where, and by whom a specimen of the Spotted Crake I recorded was shot, I am now informed that the bird was found on the 14th September beneath the telegraph-wires on the Cowes and Newport Railway, having, apparently, in its flight, come in contact with them; showing that, like many other species, it is nocturnal in its migration. Not being very rare, I merely noted its occurrence.—HENRY HADFIELD (Ventnor, Isle of Wight).

DARTFORD WARBLER IN CORNWALL.—In Mr. Rodd's "List of the Birds of Cornwall" (Zool. 2nd ser. 2231) the Dartford Warbler is included as a rare species, with the statement that "no very satisfactory record exists of the capture of this small Warbler westward, although it has been seen in some furzy ground in the parish of Madron." Ornithologists, therefore,

will be interested to hear that in the neighbourhood of Constantine, where I reside, this bird has been gradually becoming plentiful. I noticed the first I had ever seen here about three years ago, since which time I have observed them frequently amongst furze. They flit from bush to bush, and on alighting disappear immediately, very similarly to the Lesser Whitethroat.—JOHN TYACKE (Constantine, Cornwall).

DISTRIBUTION OF THE GREEN WOODPECKER IN CORNWALL.—In the eastern woodlands this bird is common, but in West Cornwall is very rare (*c. f.* Rodd, *Zool.* 2nd ser. 2239). In the neighbourhood of Constantine it was at one time very seldom seen, but of late has become more numerous.—ID.

TREE SPARROW NESTING IN MIDDLESEX.—In the last published part of the new edition of 'Yarrell's British Birds' (part 10, p. 85) a dozen counties in England are named in which the Tree Sparrow seems not yet to have been recorded as breeding, and one of these is Middlesex. On reference to an interleaved copy of my 'Birds of Middlesex' I find a MS. note, given me by the late Mr. Blyth, to the effect that in June, 1871, he obtained three half-fledged Tree Sparrows, which were taken from a nest in a hole of a tree at Hampstead. This is the only instance which has come to my knowledge of the Tree Sparrow breeding in the metropolitan county.—J. E. HARTING.

HONEY BUZZARD IN SUFFOLK.—On the 25th of September, on my uncle's property at Darsham, in this county, I shot a very fine, though immature, male Honey Buzzard. Expanse of wings four feet, and two feet from beak to tail; contents of stomach, wasp-grubs.—ARTHUR J. CLARK-KENNEDY (Little Glemham, Suffolk).

REAPPEARANCE OF PALLAS'S SAND GROUSE IN IRELAND.—A fine male specimen of this Sand Grouse was shot on the 4th of October, near Kilcock, in the County Kildare, and its companion, a female, secured at the same time. They were found feeding in a stubble-field, and, at first, were mistaken for Partridges. We have received one for preservation, the other was sent to Messrs. Ashmead and Argent, of Bishopsgate Street, London.—WILLIAMS & SON, taxidermists (2, Dame Street, Dublin).

[This fact has already been recorded in 'The Field' of 21st October, 1876, by Mr. Coates, one of the two gentlemen who procured the birds in question. It is not the first instance of the occurrence of this Sand Grouse in Ireland. In 1863, in which year a most extraordinary immigration of these singular birds took place, specimens were procured at Ross (Lord Clermont, *Zool.* 1863, p. 8934), Drumbeg (Sinclair, 'The Field,' 20th and 27th June, 1863), and Naran (M. B. Cox, 'The Field,' 18th July, 1863), the last-named being the most westerly locality for the species recorded with precision.—ED.]

VARIETY OF THE COMMON SNIPE.—A very interesting specimen has been sent to us for preservation. It is about the size of the so-called

Sabine's Snipe, but not so dark in colour; the dark bars across the breast are well marked, and are continued down to the vent. The tail contained only eleven feathers, but some may have been shot away.—WILLIAMS & SON.

[If we understand Messrs. Williams correctly, the specimen in question may be said to be intermediate in form and colour between the Common Snipe and the so-called Sabine's Snipe. If so, we should much like to see it.—ED.]

GOLDEN EAGLE NEAR KILLARNEY.—So seldom is this noble species now seen at Killarney, that it is not without regret I have to record the capture of a fine female bird, apparently in the second year's plumage, which was shot while flying over the Earl of Kenmare's deer park, about the middle of November last, by Denis Healy, one of the gamekeepers. The bird is now in the hands of Mr. Williams, the well-known taxidermist, in Dame Street, Dublin. The Golden Eagle (*Aquila chrysaëtus*) though commonly supposed to be no longer indigenous to Killarney, is yet not unfrequently observed in the mountainous parts of Kerry; and as I myself have, on more than one occasion, seen the bird hunting along the mountain sides, which border on the lakes, early in the spring, I believe there is good reason to suppose that the Golden Eagle still breeds in some of the less frequented parts of the district.—ARTHUR H. BOWLES (99, Lower Mount Street, Dublin).

GOLDEN EAGLE, ROUGH-LEGGED BUZZARD, &c., NEAR WOODBRIDGE.—During November and December, 1876, a beautiful specimen of the young of the Golden Eagle (*Aquila chrysaëtus*) was taken, together with eight specimens of the Rough-legged Buzzard (*Buteo lagopus*), in the neighbourhood of Woodbridge, Suffolk. On the 14th of December a beautiful male Merlin (*Falco æsalon*) was shot on the ooze skirting the banks of the Woodbridge river. On the 18th of December a female, from the same place, was obtained; and on the 19th of December a second female was shot near the same spot. A Hobby (*Falco subbuteo*) I watched for several minutes, after having first disturbed him from trees, perched on a gate-post abutting on stubble upon which a large flock of Linnets were feeding.—CHARLES MOOR (Great Bealings, Woodbridge, Suffolk).

A PURE WHITE JAY.—On the 20th of October, Mr. Ripley, the bird-stuffer here, showed me a young Jay, pure white, which had been shot within a few miles of York, a few days before. He had another of the ordinary colour, which was out of the same nest. The former had not a single coloured feather about it, but the whole of the plumage was of a uniform pure white. The legs of this bird were also of a whitish colour, as well as the bill; the iris, too, was of a very light colour, in fact almost white. Albinos of this species, I believe, are rare.—R. M. CHRISTY (York).

PHEASANTS IN NEW ZEALAND.—It would seem that pheasants are now fairly established in Southern New Zealand, and are tolerably numerous.

Mr. Alfred Eccles, a former Vice-President of the Otago Acclimatisation Society, has obligingly communicated an extract from the 'Otago Daily Times,' wherein a special correspondent, writing on this subject, remarks as follows:—"In riding near Popotunoa Bush recently, in company with a friend of mine—a resident at Popotunoa—we flushed two pheasants, a cock and a hen. On expressing my surprise and delight, he informed me that there were plenty more there, and that along the Kuriwao Hills (Mr. Roberts's) and up the Waiwera Gorge, and all along that range by Kaihiku Bush, and Warepa, down to South Molyneux, and for miles back, pheasants were to be found in great abundance. This is good news for sportsmen, as from the nature of the country they can never be exterminated by fair shooting, and will afford sport quite equal, if not superior, to black game shooting in Scotland. Mr. Campbell, of Glenfalloch, tells me that there is a solitary hare frequently seen about his place, both by himself and others who know a hare when they see one. It is a great puzzle where poor puss could have come from; she must have either swum the Molyneux or crossed by Balclutha bridge. I hear the rabbits are spreading very rapidly in Southland, and threaten to be a fearful curse; they are now almost, if not quite, up to the Mataura in large quantities."

BLUE SHARK OFF PLYMOUTH.—In September last a very beautiful Blue Shark (*Squalus glaucus*) was captured off Plymouth. Its length was fully eight feet, and its colour exceedingly fine. This specimen, I am sorry to say, was not preserved, but I managed to secure some of its teeth, which are finely serrated.—JOHN GATCOMBE (8, Lower Durnford Street, Stonehouse, Plymouth).

[This Shark is said to be not common during the Pilchard season off the Cornish coast.—ED.]

OCCURRENCE OF THE FOX SHARK OFF TEIGNMOUTH.—Being in Taunton one day towards the end of November, I noticed in the Corn Market a small tent erected, with a notice, written in large characters, "Strange Fish," pinned on the outside. A worthy tar, who had charge of the exhibition, assured me I should see a most extraordinary monster of the deep, which no man had ever seen before, and which no one could name. I paid the modest sum of one penny for entrance, expecting to see a dogfish or a porpoise, but found instead a remarkably fine specimen of the Fox Shark, or Thresher (*Alopes rufipes*), which measured about seven feet from the head to the end of the elongated tail. The fisherman told me that this Shark had become entangled in their herring nets, about two miles to the west of Teignmouth, and had been secured after a desperate struggle. It was very fairly stuffed, and had already been exhibited at Exeter and other towns, and no doubt will be found a more remunerative take than many good hauls of herrings.—MURRAY A. MATTHEW (Bishop's Lydeard, Taunton).

[The Fox Shark, or Thresher, although occasionally met with in various

parts of the coast, is by no means plentiful. It derives its English name of "Thresher" from its supposed habit of attacking and striking the *Grampus* with its long fox-like tail.—ED.]

OCCURRENCE OF THE BONITO AT PLYMOUTH.—In September last a specimen of the Bonito (*Scomber pelamys*) was caught in a trammel-net in the Cattewater, Plymouth. I examined the fish, and found its length to be one foot eight inches and a half; pectoral-fin, six inches—much longer in proportion to the length of the specimen than shown by Mr. Couch in his figure of this species. Another about the same size, but with the pectoral-fins still longer, was taken some years previously near Plymouth. Yet they did not equal those of a closely-allied species, the German or Long-finned Tunny (*Scomber alatunga*), which I at first thought it might be.—JOHN GATCOMBE.

[The Bonito of the tropics, so well known to navigators, is rarely seen in British waters, although, according to the late Mr. Couch, a few specimens have been taken from time to time on the Cornish coast. The colour of the fish is a fine steel-blue, darker on the back, the sides dusky, and whitish below; behind the pectoral-fin is a bright triangular section of the surface, from which four dark longitudinal lines extend backwards to the tail. The specimen above noticed is not a very large one, the species sometimes attaining a length of two feet six inches.—ED.]

LARGE TUNNY ON THE COAST OF NORFOLK.—Early on the morning of the 24th of November, 1876, a large Tunny (*Thynnus vulgaris*), exhausted, but not quite dead, came ashore at Bacton, on the Norfolk coast, where I saw it on the following day, and took the following measurements:—Total length from the point of the upper jaw to the centre of the tail, 7 feet 4 inches: length of first dorsal-fin, in inches, 10·8; of second dorsal, 15·5; of pectoral, 15·8; of ventral, 10·3; of abdominal, 14·2: breadth of tail from point to point, 33·4. The finlets, which were ten in number on the back and nine on the abdomen, were rather less than an inch in depth; the lateral prominences above the tail were about two inches wide; the ridge on the side of the body, in a line with the upper ray of the pectoral fin, projected about a quarter of an inch, and was 18·7 inches long; from the gape to the point of the upper jaw measured 8 inches, and the eye was 2·1 inches in diameter, with a silvery green iris and a very dark blue pupil. The teeth were very small, and the upper jaw projected slightly beyond the lower, which is the reverse of what is stated by Yarrell and Couch. Both the upper and lower jaws were pink, this colour reaching backwards for about two inches from the extremity of the jaws. The general colour of the upper parts of the fish was nearly black, of the sides silvery gray, and of the lower parts, and also of the gill-coverts, silvery white. The first dorsal fin was purplish black, the second dorsal pale pink, shaded in places with dark purplish, the pectoral fin resembled the first dorsal, except that it had

a white tip and the under side of the rays was also white, but tinged with pink; the ventral fin was like the pectorals, but without the white tip. The abdominal fin and the finlets were pinkish white; the tail was dark, resembling the first dorsal fin.—J. H. GURNEY (Northrepps, Norfolk).

BREEDING SEASON OF CRAYFISH.—As a note towards determining the breeding time of Sea Crayfish, I mention that I have to-day (Oct. 27, 1876) received one with the berry fully developed.—THOMAS CORNISH (Penzance).

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

November 2, 1876.—Prof. ALLMAN, President, in the chair.

Mr. Duppia Crotch exhibited a live specimen of the Norwegian Lemming, with charts showing the nature of the ground traversed in two instances in which he himself had witnessed the westerly migration of this singular little rodent.

Mr. G. Bentham read a paper on the distribution of the Monocotyledonous order into primary groups, more especially in reference to the Australian flora, with notes on some points of terminology.

Dr. Francis Day drew attention to examinations he had made on some Irish Sticklebacks (*Gasterosteus*). Abnormal variations in the presence and absence of ventral fin and spines in specimens of the Three-spined and Ten-spined Sticklebacks induce him to consider these appendages of doubtful specific value.

Mr. H. W. Bates communicated a paper by Mr. D. Sharp on the respiratory function of the Carnivorous Water Beetles (*Dytiscidae*). Experiments made by the author on numerous species show that there are wide differences in the length of time they spend submerged and on the surface for breathing purposes. Most specimens of the group are more active by night than by day.

Prof. Dickie gave a supplementary notice of Marine Algae obtained in the 'Challenger' Expedition. Of some fifty species one only is new.

A description of *Thaumanitis pseudaliris* and *Amesia perifascia*, two new Lepidopterous forms from Malacca, by Mr. A. G. Butler, was taken as read.

The same author also had a communication on the genus *Euptychia*, a revision, with the addition of twelve new species being made. A case of these butterflies was exhibited in illustration of his paper.

A second communication, by Mr. D. Sharp, referred to new species of Beetles (*Scarabæidæ*) from Central America. These had been captured by Mr. Belt, chiefly in the neighbourhood of Chontales.

Mr. A. Peckover exhibited and made a few remarks on two skins of the young of the Madagascar insectivore, *Hemicentetes nigriceps*, Günth., and on a series of insects from the same island, collected by Mr. A. Kingdon, near Antananarivo.

Mr. E. D. Crespigny showed a specimen of the Umbelliferous plant, *Tordylium maximum*, Linn., obtained near Tilbury Fort, a locality where it had disappeared for a considerable length of time.

November 16, 1876.—Prof. ALLMAN, President, in the chair.

Messrs. J. C. Oman, R. H. Peck, and D. G. Rutherford were duly elected Fellows.

Mr. H. N. Moseley, of H.M.S. 'Challenger,' read a paper on the Flora of Marion Island. This island possesses considerable interest from its isolation and being within the Antarctic drift. It is about 1000 miles from the African continent, 450 from the Crozets, 1200 from the desolate Kerguelen Island, above 2000 from Tristan D'Acunha, and 4500 from the Falklands, to which, nevertheless, its Flora appears related. It is of volcanic origin and snowclad. The rocks at half-tide are covered with *Darvilea utilis*, above high tide *Tillaea moschata* is found in abundance, and beyond the beach a swampy peaty soil covers the rocks, where there is a thick growth of herbage; this is principally composed of species of *Acana*, *Azorella*, and *Festuca*, the first of these three being the most abundant plant on the island, though the latter grass is by no means scarce. The cabbage-like plant, *Pringlea antiscorbutica*, is less profuse than at Kerguelen's Land. Some of the Ranunculus group are met with at water-pools near the sea; four kinds of Ferns were obtained, *Lomaria alpina* being the most numerous. Lichens are scarce, but Mosses in plenty form yellow patches, which stand out conspicuously midst the green vegetation, which rises to an altitude of probably 2000 feet. From the occurrence of *Pringlea* on Marion Island, the Crozets, and Kerguelen Island, and the existence of fossil tree-trunks on the two latter, the author surmises an ancient land-connection between them.

Mr. Moseley exhibited some insular floral collections in illustration of his paper and of the various parts touched at by the 'Challenger.' He also called attention to a series of volumes and pamphlets on Natural History obtained by him in Japan.

A memoir on the birds collected by Prof. Steere (Michigan, U.S.) in the Philippine Archipelago was read by Mr. R. Bowdler Sharpe, and numerous coloured drawings of the new and rare forms were exhibited and commented on. Although it is but lately that Lord Tweeddale's remarkable monograph on the Philippine birds was published, with immense additions to the Avifauna, yet Prof. Steere's collection has yielded over sixty hitherto unknown species. Many novelties may therefore still be

expected as further exploration proceeds. The recorded species of birds from the Philippines at present amount to 285.

A letter containing observations on the American Grasshopper (*Caloptenus femur-rubrum*), with remarks on the same, by Mr. F. Smith, was noticed.

December 7, 1876.—G. BENTHAM, Esq., Vice-President, in the chair.

Thirteen new Fellows were balloted for, and duly elected.

The botanical papers read were "New British Lichens," by the Rev. W. A. Leighton, and "A General Systematic Arrangement of the *Iridaceæ* (the Iris family)," by J. G. Baker, of Kew.

Dr. Francis Day read a paper "On the Geographical Distribution of the Fresh-Water Fishes of India." He says that out of nine families of Spiny-rayed Fish (Acanthopterygians) only two are likewise found in the African region; but one of these is in Madagascar, therefore doubtfully African, the other is also found in the Malay Archipelago, which possesses representatives of eight out of nine families. The fresh-water fishes of Ceylon, the Andamans and Nicobars, he believes, are strictly Indian, while, as these fishes cannot be spread except by line of fresh-water communication, it thus appears highly probable that these islands were at one time connected with the Continent of India. Moreover, certain forms exist in Malabar which are absent from the rest of India, but reappear in the region of Chittagong or Siam. The evidence derived from his data shows that the Fauna of Hindostan preponderates towards the Malayan, and not African, region, as many aver.

Mr. Christy exhibited and made remarks on specimens of the so-called Black Coral (*Antipathes*) from the Philippines.

ZOOLOGICAL SOCIETY OF LONDON.

November 7, 1876.—Prof. NEWTON, F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the months of June, July, August and September, 1876.

A letter was read from Dr. Otto Finsch relating to the supposed existence of the Wild Camel (*Camelus bactrianus*) in Central Asia.

A letter was read from Mr. E. Pierson Ramsay, giving a description of the habits of some *Ceratodi* living in the Australian Museum, Sydney, which he had lately received from Queensland.

Mr. W. K. Parker read a memoir on the structure and development of the skull in the Sharks and Rays.

Prof. A. Newton made a correction of some of the statements in Canon Tristram's "Note on the Discovery of the Roebuck in Palestine" (Proc. Zool. Soc., 1876; page 421).

Lieut.-Colonel Beddome gave the description of a new species of Indian Snake from Manantawaddy in the Wynaad Hills, which he proposed to name *Platylecturus Hewtoni*.

Dr. G. E. Dobson communicated a monograph of the Bats of the group *Molossi*.

Dr. A. Günther read a report on some of the recent additions to the Collection of Mammalia in the British Museum, amongst the most remarkable of which was a new form of Porcupine, from Borneo, proposed to be called *Trichys lipura*; and a new Marmozet, obtained by Mr. T. K. Salmon, near Medellin, U.S. of Columbia, to which the name *Hapale leucopus* was given.

November 21, 1876.—Prof. FLOWER, F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of October.

Mr. Sclater exhibited and made remarks on the skin of a young Rhinoceros (*R. sondaicus*), belonging to Mr. W. Jamrach, which had been captured in the Sunderbunds, near Calcutta, in May last.

The Secretary exhibited, on behalf of Mr. Andrew Anderson, a coloured drawing of a specimen of *Emys Hamiltoni*, lately captured at Futtehgurh (Ganges). The occurrence of this *Emys*, chiefly confined to Lower Bengal, so far west as Futtehgurh, was considered as of much interest.

A letter was read from Count T. Salvadori, containing remarks on some of the birds mentioned by Signor D'Albertis, as seen by him during his first excursion up the Fly River.

A communication was read from Mr. G. B. Sowerby, jun., containing descriptions of six new species of shells, from the collections of the Marchioness Paulucci and Dr. Prevost.

Mr. Edward R. Alston read a paper containing the descriptions of two new species of *Hesperomys* from Central America, which he proposed to call respectively *Hesperomys teguina* and *H. Couesi*.

A paper was read by Professor Garrod on the Chinese Deer, named *Lophotragus michianus*, by Mr. Swinhoe, in which he contended that the species so called was identical with *Elaphodus cephalophorus* (A. Milne-Edwards), obtained by Père David in Moupin. He pointed out the close affinity between the genera *Elaphodus* and *Cervulus*, the latter differing little more than in the possession of frontal cutaneous glands not found in the former.

Mr. Arthur G. Butler read a paper containing descriptions of new species of Lepidoptera from New Guinea, with a notice of a new genus.

A communication was read from Dr. J. S. Bowerbank, being the eighth of his series of "Contributions to a General History of the *Spongiadæ*."

December 5, 1876.—Dr. E. HAMILTON, Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of November, and called particular attention to four Brazilian Cormorants (*Phalacrocorax brasiliensis*), purchased, and a Hooded Crane (*Grus monachus*), received on deposit.

A letter was read from Count T. Salvadori, announcing that a new species of Paradise-bird of the genus *Drepanornis*, had been discovered near the most inland point of Geelvink Bay, New Guinea.

A communication was read from Mr. Andrew Anderson, containing some corrections of and additions to previous papers on the "Raptorial Birds of North-Western India."

Mr. Francis Day read a paper on the fishes collected by the Yarkand Mission, in 1873, to which the late Dr. Stoliezka was attached as naturalist. The paper gave an outline sketch of the Fresh-water Fishes of Hindostan, Afghanistan, Western Turkestan, Yarkand, Tibet, and Cashmere. The author showed that the principal fishes of Yarkand belong to a local group of Carps, termed "Hill Barbels, or *Schizothoracina*," by McClelland; that this group is almost restricted to cold and elevated regions, spreading to the most eastern portion of Western Turkestan, Afghanistan, and along the slopes of the Himalayas to China; and that these forms are entirely distinct from the Carps of the plains to the south of the Himalayas.

A communication was read from Mr. Martin Jacoby, giving descriptions of new genera and species of phytophagous Coleoptera.

A communication was read from Dr. A. Günther, containing the description of a new species of Lizard from Asia Minor, which he proposed to name *Zootoca Danfordi*, after Mr. C. G. Danford, its discoverer.

Dr. Günther communicated a paper by Mr. W. Ferguson, of Colombo, containing the description of a new species of Snake of the genus *Aspidura* from Ceylon, for which the name of *A. Guentheri* was proposed.—P. L. Sclater.

ENTOMOLOGICAL SOCIETY OF LONDON.

November 1, 1876.—Professor WESTWOOD, M.A., President, in the chair.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:—'Proceedings of the Zoological Society,' 1876, parts ii. and iii.; by the Society. 'The Zoologist' and 'Newman's Entomologist' for November; by the Representatives of the late Edward Newman. 'The Entomologist's Monthly Magazine' for November; by the Editors. 'The Naturalist; Journal of the West Riding Consolidated Naturalists' Society,' no. xvi.; by the Editor. 'Nature,' nos. 362—365; by the Publishers.

'L'Abeille,' nos. 180 and 181; by the Editor, M. S. A. de Marseul. 'Iconographie de Chenilles et Lepidoptères inédits,' par E. Millière, tom. iii., part 35 (concluding the work); by J. W. Dunning. 'Catalogo della Collezione di Insetti Italiani del R. Museo di Firenze,' serie 1a, Coleotteri; 'Buletino della Società Entomologica Italiana,' anno ottavo, trimestre iii.; by the Society. 'Horae Societatis Entomologice Rossicæ,' t. xi., nos. 2, 3 and 4; by the Entomological Society of Russia. 'The American Naturalist,' vol. x., nos. 9 and 10; by the Editor. 'Transactions of the Academy of Science of St. Louis,' vol. iii., nos. 1—3; by the Society.

Exhibitions, &c.

Mr. F. Smith exhibited some remarkable specimens of thorns from Natal and Brazil, which had been taken possession of by certain species of Cryptoceridae for the construction of their formicaria: some of them were as much as three inches in length.

Mr. Champion exhibited a bug sent by Mr. Walker from Besika Bay. It was figured in Guerin's Mag. de Zool. under the name of *Mustha spinosula*.

Professor Westwood mentioned that a caterpillar had been forwarded to him from Deal, the captor complaining that he had suffered from considerable irritation of the skin, caused by the hairs of the insect, and that the irritation had continued for a week afterwards. It was the larva of *Lasiocampa rubi*.

The Professor exhibited a singular Coleopterous larva, from Zanzibar, of a flattened, ovate form and a steel-blue colour, with two points at the extremity of the body and with long clavate antennæ: the head bore some resemblance to that of the Dipterous genus *Diopsis*. He also exhibited a specimen of the butterfly *Hesperia Sylvanus*, received from the Rev. Mr. Higgins, of Liverpool, having the pollinaria, apparently of an orchid, attached to the base of the tongue. Also the bulb of an orchid, purchased by Mr. Hewitson with a collection of roots from Ecuador, which was found to contain nine living specimens of cockroaches, comprising six different species, viz., *Blatta orientalis*, *Americana*, *cinerea*, *Maderæ*, and two others unknown to him, some being of considerable size.

Professor Westwood alluded to the varied nature of the collection recently exhibited at the "Exposition des Insectes utiles et des Insectes nuisibles," in Paris, and remarked on the absence in the list of exhibitors of the names of many distinguished French entomologists.

Mr. Dunning read the following:—

Note on Acentropus.

"In the Transactions of the Entomological Society of the Netherlands for the present year (Tijd. v. Entom. xix. 1), Heer Ritsema has published

a Second Supplement to his 'Historical Review of the genus Acentropus;' and the author, writing in June, 1875, prefaces it with the welcome announcement that he has worked up the literature to the present time, 'as in all probability I shall be able in this summer to complete the history of the mode of life and the different stages of *A. niveus*.'

"Whether this expectation has been fulfilled, either in 1875 or 1876, I do not know. But, however this may be, I am sure Heer Ritsema will be glad to learn that, though he and I failed to convince Newman that the genus is properly placed in the Lepidoptera, we did make a convert of Doubleday. In a Supplement to his 'Synonymic List of British Lepidoptera,' published in 1873, Doubleday for the first time admitted *Acentropus* into that order. Its precise place in the order is not indicated, but it is immediately followed in the Supplement by a species of *Ebulea* (*Botydæ*), which sufficiently shows that the position which Doubleday would assign to *Acentropus* is in or near the *Hydrocampidae*.

"It may possibly be remembered that, in a paper which the Society did me the honour to publish in the 'Transactions' for 1872 (pp. 121 and 281), I adduced some arguments tending to show that there is really one species, and one only, of this genus; and in a note on p. 156, the position is thus summed up;—'I am quite in accord with Ritsema when he says that *A. Hansoni*, *Garnonsii*, *Nevæ*, *badensis* and *germanicus* are not specifically distinct from *A. niveus*; but I go a step further, and say that *A. latipennis* is identical with *A. Hansoni*.' Ritsema is now satisfied that *A. latipennis* is identical with *A. Hansoni*, but still thinks that there are two species, of which one (*A. niveus*, *Oliv.* = *A. Garnonsii*, *Curt.*) has a female with rudimentary wings, and the other (*A. latipennis*, *Möschl.* = *Zancl Hansoni*, *Ste.*) has a female with normally developed wings. Doubleday, in the Supplementary Catalogue already mentioned, does not go into the synonymy at length, but records one species only, under the name of *A. niveus*, giving *latipennis* as a variety, thus:—

ACENTROPUS NIVEUS. *Niveus*, Olivier?
latipennis, Möschl., var.

"I am not able to throw any further light on the specific identity or distinctness of the two forms. Ritsema, however, refers to his having found many specimens, all males, at Arnheim, and to the capture at Huissen (near Arnheim) of a winged female, which he recognises as *A. latipennis*. 'By this capture' (says he, at p. 15), 'I am fortified afresh in the opinion that there are two species. . . . For it would be otherwise inexplicable that amongst the innumerable winged individuals captured by me at Overween, not a single female occurred, and that I, by breeding from larvæ coming from the same place, obtained only females (in number already amounting

to fifteen), which were furnished with wing-rudiments and live in the water, whilst the first specimen that is *captured* at HuisSEN, inside the house at a lamp, is a female with well-developed wings.' I must confess that I cannot follow this reasoning. Be it remembered that no difference is suggested in the males from the different localities, and the supposed distinctness of the species rests entirely on the possession by the females in the one case of developed and in the other of rudimentary wings. From Arnheim and HuisSEN, males, and one winged female captured; from OverveEN, males, and fifteen unwinged females bred. *Ergo*, two species! Surely this is a *non sequitur*. It is, in fact, a repetition of Brown's argument (with which I dealt in the 'Transactions' for 1872, p. 142), that the winged female occurs in one locality, and the apterous females in another locality. I can scarcely see how the facts mentioned by Ritsema can be said to fortify any opinion one way or the other. So far from proving the duality, they are quite consistent with the unity of the species. And recalling the facts that Curtis and Dale took both forms of female at Glanville's Wootton, that Brown bred the apterous and McLachlan captured the winged form at Burton, and lastly that Ritsema himself, in 1870, found pupæ at Haarlem from which two females emerged, of which one had rudimentary and the other well-developed wings, I venture to hazard a conjecture, that if Ritsema perseveres with his breeding from OverveEN larvæ, he will obtain some females with wings as ample as those which flew to the lamp at HuisSEN.

"In conclusion, one word of regret, a tribute to Members this Society has lost. In the short period since the publication of my former paper on Acentropus, of those to whom I then referred as living authors, death has removed no less than three—Henry Doubleday, Edward Newman and Edwin Brown."—*F. G.*

NOTICES OF NEW BOOKS.

A History of British Birds. By the late WILLIAM YARRELL, V.-P.L.S., F.Z.S. Fourth Edition. Revised by ALFRED NEWTON, M.A., F.R.S., Professor of Zoology and Comparative Anatomy in the University of Cambridge. Part 10, Nov. 1876. Van Voorst, Paternoster Row.

WE note with satisfaction the appearance of another part of the new edition of this standard work, the issue of which is steadily, although, we regret to say, slowly progressing. In some measure, no doubt, the advancement of the work has been retarded by

reason of the great labour entailed in satisfactorily working out the small passerine birds, especially in the case of such difficult groups as the Wagtails, Pipits, and Linnets, where a nice discrimination of species and a careful comparison of authorities on the subject of geographical distribution has obviously necessitated a vast expenditure of time and trouble. Now that the Editor has almost completed this troublesome portion of the work, we may hopefully look for a more rapid issue of succeeding parts.

On glancing through the number before us, we find that much new matter has been introduced, even in the case of very common species. It would scarcely have been supposed that so universally distributed a bird as the common House Sparrow could be anywhere unknown in England, and yet we find the observation (at p. 94, note) that Mr. Rowe states that at Shepstow, a moorland village in Devon, the Sparrow is never seen. The Editor adds that this is the sole exception to its universal distribution in England known to him.

Throughout the whole of the palæarctic region this ubiquitous bird has been found, penetrating Siberia, and extending its range across the Asiatic continent as far northward as lat. 61° N., and as far to the east as the confluence of the Shilka and Argun. If the Sparrow of India be not a distinct species, as we believe it is not, we may trace our old friend from Yarkand to Siam and Ceylon. Unable, apparently, to thrive anywhere away from human habitation, "it keeps extending its area as desert countries are settled by man, being dependent on him for its living." "Thus," says Professor Newton, "the questions are opened whether it should not be regarded as a parasite throughout the greater part of its present range, and what should be deemed its native country. These are points which seem never to have been discussed, but for all that are none the less worthy of consideration."

The Hawfinch, so long described by ornithologists as an accidental visitor, is now known to inhabit various parts of England in considerable numbers, and is believed to be increasing year by year (p. 98). The seed of the hornbeam is said to be a favourite morsel with this bird, "but it also feeds on the kernels of haws, laurels, plums and other stone-fruits, and in summer makes great havock amongst green pease" (p. 99).

The Serin Finch, not mentioned in previous editions of the present work, is now included and figured; the increased attention

bestowed on Ornithology having resulted in its detection in various parts of the South of England.

The remarks on the nesting of the Siskin deserve careful perusal, and various interesting notes on the local names of birds and their derivation, which are scattered throughout this number, cannot fail to be acceptable to ornithologists.

The Birds of Marlborough. By EVERARD F. IM THURN. Appendix, pp. 10, demy 8vo. Perkins & Son, Marlborough. 1876.

ON taking up this pamphlet, the first thing that strikes us is the obvious inconvenience which results from publishing an Appendix in a larger form than the volume which it is intended to supplement, the original publication being a small post and the present addition a demy octavo. The two consequently cannot be bound together. Saving this objection, the new pages bear testimony to the interest which is taken in one at least of our public schools in the subject of Natural History, and to the progress which is being made in a particular branch of it.

We are glad to see that the objections which we pointed out to the systematic arrangement adopted by Mr. Im Thurn in his earlier production have since received his consideration and concurrence, and that he now admits the inconvenience which has been found to arise from it. He says:—

“I now think that the plan is useless, and only serves to confuse the reader. If it is adopted in a history of the birds of a district, it should at least be accompanied by a synoptic list of the whole of the birds in their proper order. I now hold this view so strongly that I take the present opportunity to give such a list, in which will be found the names of all the birds which we know to have occurred within a district extending for eight miles round Marlborough.”

The reasons for fixing this limit will be found in the preface to the earlier publication.

The new species which have been added to the list since 1870 are the Hen Harrier, Whimbrel, Spotted Crake, Pintailed Duck, Scaup, Common Scoter, Shag and Little Gull, almost all of which are inserted on the strength of a single occurrence, while the majority of them can only be regarded as purely accidental visitants to the district.

We have not space to criticise the list in detail, but we may observe that some of the author's corrections of former statements are not improvements. For example, the Hobby, formerly regarded as an occasional visitor, is now marked as "a resident, though a scarce one," whereas it would have been more accurately described as a summer migrant. The Merlin has been transferred from the occasional visitors to the residents, while there can be no doubt that, as regards the South of England, its place is amongst the winter visitants.

Notwithstanding the new paragraph from the 'Marlborough Times' anent the Curlew nesting on Aldebourne Downs, we are still sceptical on the subject, and cannot doubt that the species referred to is the Stone Curlew or Thick-knee. The true Curlew (*Numenius arquata*), in all probability, only occurs on passage.

The Official Report of the Recent Arctic Expedition. By Captain NARES, R.N., Commander of the Expedition. With a Map. 8vo, pp. 96. Murray; London. 1876.

IN an octavo pamphlet of ninety-six pages Captain Nares has given a brief but clear account of all that befell the crews of the 'Alert' and 'Discovery' on their recent Expedition, from the date of their leaving Upernivik in July, 1875, until their arrival home in October, 1876.

Notwithstanding the extreme interest which attaches to this Report, and which, in its handy and accessible form, should be read *in extenso* by everyone, it would be beyond our province to deal with any but the zoological portion of it, and to this therefore we confine attention.

Of course, in a general report such as this is, we do not expect to find the details which are most likely to interest readers of 'The Zoologist,' for these are reserved for publication in the special Report of the Naturalists to the Expedition. At page 47, the Commander of the Expedition, paying a well-deserved compliment to Captain Feilden, says:—

"I have not hitherto alluded to the services of Capt. Feilden, Paymaster R.A., Naturalist to the Expedition, preferring that the Report on the numerous scientific subjects to which he has directed his attention should

emanate from himself; I will merely state here that no one moment has been lost by this indefatigable collector and observer. He has, moreover, by his genial and ready help on all occasions, won the friendship of all, and I feel confident that their Lordships will highly appreciate his valuable services. I am only doing him justice when I state that he has been to this Expedition what Sabine was to that under Sir Edward Parry."

This is good news for naturalists, and we look forward with pleasurable expectations to the appearance of Capt. Feilden's own account of his labours.

Meantime, on glancing through the Report before us, we do not fail to notice the occasional allusions which are made to the game and wild-fowl procured *en route* by the officers and crews of both vessels. In the neighbourhood of Hayes Sound the sportsmen discovered a richly vegetated valley, with numerous traces of Musk Oxen and other game (p. 10). Walrus Shoal, off Franklin Pierce Bay, and a mile to the eastward of Norman Lockyer Island, was so named from the numerous remains of Esquimaux found on the island, who, to judge by the number of bones lying about, had evidently subsisted principally on these animals. At present this neighbourhood may be considered as the northern limit of their migration, only a very few having been seen further to the north (p. 16).

"On entering Discovery Harbour," says Capt. Nares (p. 24), "we had the satisfaction of sighting a herd of nine Musk Oxen, all of which were killed; our joy at the good luck being greatly increased by the news that the vegetation was considerably richer than that of any part of the coast visited by us north of Port Foulke, the Elysium of the Arctic regions."

Here the 'Discovery' made her winter quarters, and the 'Alert' pushed onward alone. The winter quarters of the latter vessel were established off Cape Sheridan, in the highest northern latitude ever yet reached by a ship. Capt. Nares' account of the situation, and of the long arctic winter, with its unparalleled intensity and duration of darkness for one hundred and forty-two days, is engrossing in the extreme.

The vicinity of the winter quarters of the 'Alert' "proved to be unfavoured by game."

"On our first arrival," says Capt. Nares (p. 48), "a few Ducks were seen and five shot; and during the winter and spring three Hares were

shot in the neighbourhood of the ship. This completes our list up to the end of May. In March a Wolf suddenly made his appearance; and the same day the track of three Musk Oxen or Reindeer were seen within two miles of the ship, but they had evidently only paid us a flying visit.

"In July six Musk Oxen were shot, the only ones seen in our neighbourhood. The travelling parties were only slightly more fortunate in obtaining game.

"In June a few Ptarmigan, Ducks, and Geese were shot, and used by the sick. In July and August they obtained a ration of fresh meat daily.

"In March and the beginning of April about two dozen Ptarmigan passed the ship, flying towards the N.W. in pairs: finding no vegetation uncovered by snow in our neighbourhood, they flew on, seeking better feeding grounds, and were nearly all shot subsequently by the outlying parties near Cape Joseph Henry. In the middle of May, Snow Buntings and Knots arrived. A number of the young of the latter were killed in July, but no nests or eggs were found. Early in June, Ducks and Geese passed, in small flocks of about a dozen, flying towards the N.W., but owing to a heavy fall of snow, lasting three days, which covered the land more completely than at any other time during our stay, at least half the number returned to the southward, not pleased with their prospects so far north.

"Two dozen small Trout were caught during the autumn and summer in lakes from which they could not possibly escape to the sea.

"The total game list for the neighbourhood of the 'Alert's' winter quarters is as follows:—

"In winter quarters—Musk Oxen, 6; Hares, 7; Geese, 67; King Ducks, 12; Longtailed Ducks, 9; Seal, 1; Foxes, 3.

"By short service sledging parties—Hares, 13; Geese, 3; King Ducks, 5; Ptarmigan, 10.

"Total—Musk Oxen, 6; Hares, 20; Geese, 70; King Ducks, 17; Longtailed Ducks, 9; Ptarmigan, 10; Seal, 1; and Foxes, 3."

At the lakes in the neighbourhood of Cape Beechy, on the voyage home (August 4th) a number of Geese were found, all unable to fly; the old ones moulting were nearly all featherless, and the young ones, although well-grown, were yet unfledged. Fifty-seven were captured (p. 77).

The species of Goose is not named, but in all probability it was the Brent. On this, however, as well as on many other points of interest, we shall no doubt be duly enlightened in the forthcoming special Report of the Naturalists to the Expedition.

THE ZOOLOGIST.

THIRD SERIES.

VOL. I.]

FEBRUARY, 1877.

[No. 2.

ON THE AUTUMNAL MIGRATION OF BIRDS ON THE YORKSHIRE COAST.

BY FREDERICK BOYES.

ON the 23rd of October last I went down to Spurn Head to witness the arrival of our autumn immigrants, and an account of what I saw may be of interest to the readers of 'The Zoologist.'

First, as to the place, Spurn Point is the terminal portion of a narrow peninsula about four miles in length, which is washed by the sea on the one side, and the Humber on the other. It was in olden times very much broader than it is now; indeed it is not unlikely that the sea will eventually swallow it up altogether, since, even within the memory of man, it has made such encroachments that there is now in some places only a very narrow strip a few yards in width unwashed by the tide, and as this is composed entirely of sandhills and "bent" grass, it offers but a poor resistance against a rough sea. The spot is well situated for the observation of migratory birds as they pass overhead or rest after their long journeys, and has long been noted for the number that annually alight there, many of them being so fatigued with their passage that they are only too glad to pitch on the first strip of land they fall in with, no matter how unsuited it may be to their natural requirements.

During the two or three days of easterly winds which prevailed previous to my visit, a great portion of the large army of southward-bound birds had already passed Spurn; but I was not too late to see much that was interesting, and to note a few facts that were either new to me, or of which I had previously heard only by

report. The most noticeable feature was the great number of Robins; there were scores, I think I may say hundreds, of them hopping about this out-of-the-way place, which must have formed a great contrast to their usual haunts amongst homesteads and gardens: they had evidently quite lately arrived, and were resting themselves previously to dispersing over the country or moving still further southward. I am afraid they were only getting a scanty supply of food, for what they could find amongst long grass and sand I can scarcely say. In a small walled garden only a very few yards square, containing a few currant trees, &c., there must have been twenty or thirty of them—native informants said fifty at least—searching for food; and in all the ditches and hedgerows of the cultivated lands further from the coast, Robins were very plentiful. This migration of the Redbreast is not new, but I believe an annual occurrence. Last year at this spot they were even more numerous.

The next birds in point of numbers were the Goldcrests, or "Woodcock-pilots," as they are locally called, and they were everywhere; many of them being so exhausted as to be easily knocked down with a hat, and numbers might have been caught in an ordinary insect-net. Prior to my arrival two Rough-legged Buzzards had been shot; I saw one of them, a very fine female.

There were numbers of Blackbirds, Thrushes and Redwings in the neighbourhood, and small parties of the latter were passing at intervals all day long. There was this difference in these birds, that while the Redwings migrated in small flocks, the Blackbirds and Thrushes did so singly or in twos and threes. I saw a Ring Ouzel and a solitary Fieldfare, but was told that a flock of about fifty of the latter birds had arrived so early as the last week in September, and though I told my informant that he must have been mistaken, he assured me he was not.

A few Woodcocks were shot, and there were numbers of Short-eared Owls and a single Long-eared one, which latter had killed itself against the telegraph-wire. I met two shooters who had bagged no less than nine Short-eared Owls for "screens"; these were afterwards sent to Mr. Richardson, the birdstuffer here, where I dissected several of them, and found the stomachs empty in every case but one, and this contained the remains of a Blackbird, probably found dead beneath the telegraph-wires.

Amongst this host of bird-life a few Great Gray Shrikes were seen, and three or four were shot; two of them by myself. The stomach of one of these contained part of a Common Wren, one foot and leg being entire. I think I have already mentioned in 'The Zoologist' that these Shrikes arrive with the Redwings, &c., at this time of the year. Occasionally I disturbed Common Wrens from amongst the long grass, and as Mr. Cordeaux had some time ago, if I remember rightly, expressed an idea that some Wrens he had observed at Spurn in the autumn looked larger than the Common Wren, I procured two for identification.

I observed numbers of Chaffinches and a few Bramblings; also a few Lesser Redpolls and one Mealy Redpoll, which last I shot; it was a male, and alone when I shot it. Some half-dozen Reed Buntings which I saw were no doubt migrants; they were all in winter plumage. A flock of Common Linnets were seen several times, but as these birds breed there amongst the coarse grass, I cannot include them in the migratory list. I saw no Twites, though they are usually present there in the autumn, nor did I see a single Snow Bunting. The only summer birds I noticed were one or two Willow Wrens.

All the species I have mentioned were resting from their journey, and would be moving again in a few days: some of them only rest a day and then are off again, and their places are taken by others. Looking at the small area of the ground which formed the scene of my observations, the great host of immigrants that visit it from the north at this season of the year is marvellous. A very striking feature was the great number of Rooks passing overhead at intervals all day long; in some instances the flocks were composed of Rooks and Jackdaws mixed. Hooded Crows in straggling parties and Sky Larks in small flocks were also passing all the day. All these birds were steering a direct southerly course. The birds comprising some of the flocks of Rooks looked tired, and moved slowly at no great altitude; others, and especially the larger flocks, were high in the air, and were evidently not so much distressed: the Jackdaws were very noisy. This migration of the *Corvidæ* had been going on for some few days previously, and would no doubt continue some days longer. Were they noticed passing the south coast? and whence their destination?

[This article was received prior to the appearance of 'The Zoologist' for January, and its publication was only delayed for want of space.—ED.]

ORNITHOLOGICAL NOTES FROM DEVON AND CORNWALL
DURING THE AUTUMN OF 1876.

By JOHN GATCOMBE.

ON my return to Plymouth I went to see the variety of Yellow Bunting mentioned in my last notes (2nd ser. 5146), and found it to be really of a bright yellow canary-colour, and not light buff, like Mr. Bond's specimen. To show how nearly it resembled a Canary in colour, I was told by the birdstuffer that when it was first brought to him, seeing that it was in a rough and mutilated condition, and not for a moment doubting it to be a Canary, he advised the servant to take it back to his master, with the message that he did not consider it worth preserving. This the man did, but brought it again the next day, saying that his master particularly wished it to be stuffed, that it was shot on Dartmoor, and hoped he would try to do his best with it; upon which Mr. Peacock examined the bird more closely than he did at first, and found, to his surprise, that it was not a Canary but a Yellow Bunting.

Some Scoters were obtained in Plymouth Sound on the 3rd of October, one of which was a very fine adult male. On the following day a white Swallow was killed at Huntshill, near Bridgwater. On the 14th an immature white Spoonbill was brought to Plymouth Market, which was killed on the banks of the St. Germans river, Cornwall. On the 21st a young Black Tern was shot in Plymouth Sound, and other Terns seen. The last Wheatear noted by me for the season was seen on the rocks at the Devil's Point, Stonehouse, on the 23rd of the same month.

A young Red-throated Diver, shot in the Sound, had the stomach crammed with Sprats: a common name for this species is Sprat Loon. The contents of the stomach of a Cormorant, killed the same day, consisted of three Wrasses of a tolerably good size. A young Merganser was also obtained in Plymouth Sound, and its stomach was found to contain several Blennies, showing that it must have been fishing close to the rocks.

Several Long-eared Owls were brought to the birdstuffers on the 30th of October, and flocks of Ring Ouzels were seen on Dartmoor. The following day I observed a Snow Bunting on the cliffs near Mount Batten. The wind was N.E., and very cold, after two days' frost. This little bird was so tame that I got within three

yards of it, and then had some difficulty in frightening it away, which I did on account of there being some birdcatchers in the immediate vicinity. Further along the coast, towards the Mewstone, I observed a large Northern Diver, many Cormorants, and some Wigeon.

The Black Redstart, as usual, made its appearance on the Devonshire coast during the first week in November. On the 6th of that month I observed an immature bird on the rock at Stonehouse: on the 8th a fine old male on the rocks near the Plymouth Citadel, and on the 24th another young bird, near the Devil's Point, Stonehouse. On the 4th of November I observed about thirty Herons on the mud-banks of the river Tamar, near Warleigh, where there is a herony. On the same day I examined six Short-eared Owls, which had been brought to the birdstuffer for preservation: they were very plentiful last season. Kingfishers were also numerous on the coast, and many were killed, I am sorry to say. The Common Gull (*L. canus*), I think, was rather more abundant than it has been for the last few years. Three Water Ouzels were killed on Dartmoor on the 4th: I examined their stomachs, and found that they contained nothing but insects. A Gray Shrike was seen on the moor between Lydford and Bride-stowe on the 15th.

On the 22nd November, whilst walking along the coast beyond Bovisand, I observed a fine pair of Ravens and a Gannet, and surprised a Crow in a nook amongst the rocks, feeding on a dead Herring Gull. On the same day, at Burrow Island, some miles further to the east, large flocks of Sanderlings were seen, and many specimens killed, some of which I examined, and found them to have assumed their full winter dress. A young Common Tern was also obtained: this is very late in the season for this species to be found on our coast.

Some adult Great Blackbacked Gulls made their appearance in our harbour on the 25th November, no doubt in consequence of the prevailing severe gales: they do not usually arrive until after Christmas, unless the weather be very stormy. I examined a fine old male which had been shot, and found that the white of the head and neck was nearly as pure as in the breeding season, with only a few very faint dusky lines appearing.

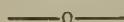
Two Gannets were seen off Bovisand Bay on the 20th, and one was shot; the tail of this bird was so much worn that it had the

appearance of having been eaten by moths, the shafts of some of the feathers alone remaining. On the 21st an immature Black-throated Diver was killed in the Sound. Although so similar to the Great Northern Diver in both its immature and winter plumage, I think this species may always be distinguished by its smaller size and the form of its bill, which is more slender and has less of an angle on the lower mandible. The ridge of the upper mandible also is slightly more curved or arched, while the top of the head and back of the neck is of a more pure and uniform gray, without any indication of the dusky band always more or less observable on that of the Northern Diver, even in its immature and winter dress.

The severe and long-continued gales in December brought an unusual number of Great Northern Divers to our coasts, and during that month I examined no less than twelve specimens, in the flesh, which had been sent to the Plymouth and Stonehouse birdstuffers for preservation: I also observed as many more in our bays and estuaries. The local papers, too, recorded the capture of several on various parts of the coast. Some Redthroated Divers were also obtained, but they were not nearly so plentiful as the Great Northern. During a heavy gale on December 5th a Gray Phalarope was seen by myself and others swimming close to the rocks near the Devil's Point, Stonehouse: it was in perfect winter plumage, and very tame, but being constantly persecuted and pelted with stones, it frequently rose and flew a short distance, each time uttering a feeble note or cry, described by the bystanders as a kind of squeak or whistle: this sound I am sorry to say I did not myself hear, being unfortunately slightly deaf, nor was I so close to the bird as some others were. I may here mention that the Gray Phalarope is rarely seen on the coast of Devon so late in the year. Cormorants and Shags were very numerous in December, frequenting the bays and estuaries during the day, and returning, singly, or in small parties, to the cliffs and high rocks towards dusk. One day I watched a Shag struggling with a large "Father-lasher" (*Cottus scorpius*), which it did not contrive to swallow for a quarter of an hour: Divers and Cormorants generally seem to have much trouble with this kind of fish, on account, I suspect, of its large and well-armed head. Strange to say, whilst writing this, I laid down my pen to watch with my glass a large Northern Diver in difficulties with a

fish, apparently of the same kind, in the harbour, not two hundred yards from the window of the room in which I write, and this fine fellow did not seem to manage it a bit better than the Shag. But of all fish a large Flounder or Dab is to the Northern Diver by far the most troublesome to manage.

On the 11th December I saw another immature Black Redstart on the rocks at Stonehouse. There were two young male Golden-eyes in the Plymouth Market on the 16th, presumably obtained in the neighbourhood. Little Grebes at the same time were very plentiful in the rivers and estuaries; thirteen of the latter were seen together on the Laira, and several were brought to our birdstuffers; some of them, strange to say, still retaining traces of the breeding plumage, having the cheeks and sides of the neck strongly tinged with chesnut or bay, and the breast and belly clouded or spotted with dusky gray. During the same month some Long-eared Owls were killed in the neighbourhood of Plymouth, and several Oystercatchers were seen and shot on the Plymouth Breakwater.



OCCASIONAL NOTES.

A CURIOUSLY-COLOURED WEASEL.—On the 25th December, 1876, a Weasel was caught in a rat-trap at Northrepps, Norfolk, which had both fore feet and one fore leg entirely white, also an oblong brown spot in the midst of the white of the abdomen. The Weasel not being subject to a seasonal change of colour like the Stoat, I think this variation from the normal colouring worth recording. The specimen was an exceedingly small female, weighing not quite two ounces.—J. H. GURNEY (Northrepps, Norwich).

[In the second edition of Bell's 'British Quadrupeds' it is stated (p. 188) that "sometimes, though rarely, the Weasel becomes white in winter; and the tail, though paler than at other times, always retains its reddish tinge, as that of the Stoat does its black tip."—ED.]

ON THE OCCURRENCE OF THE LEMMING IN NEWFOUNDLAND.—Since reading the interesting paper by Mr. W. D. Crotch on the "Migration and Habits of the Norwegian Lemming" (Journal of Linnean Society, vol. xiii. No. 65, p. 83), it strikes me that there is just a possibility that this interesting little animal may be found to inhabit the mountains in the northern parts of Newfoundland. It is, I believe, indisputably proved that the Lemming is an inhabitant of Greenland: then why not Newfoundland? I know of no other species of the *Arricola*, or even of the *Muridae*, which makes such

a periodical, and withal suicidal, migration. In my "Notes on the Zoology of Newfoundland" (Zool. 2nd ser. 2042) will be found the following note:—"Strange to say that during a residence of two years in Newfoundland I never could obtain, nor even see, any species of mouse; although the settlers assured me that in some seasons they literally swarmed, but whether of this genus (*Mus*) or not I was unable to learn. Probably *M. musculus*, Linn., occurs on the island, but from the accounts of the settlers I should infer is not the species which is periodically seen in such large quantities: these probably belong to the genus *Arvicola*, or to some allied genus. If true, there is something peculiarly interesting in these periodical visitations—or, I should, perhaps, rather say migrations—of mice, for I was informed that these muscine armies come from the interior, or from that direction, towards the sea, which they boldly enter, and are consequently drowned and their bodies cast on the shore 'by thousands.' " Without entering into Mr. Crotch's theory of the probable cause of these periodical migrations of the Norwegian Lemming, I will only add that, like that species, its Newfoundland congener *invariably migrates towards the west*. May I, therefore, through the medium of 'The Zoologist,' call the attention of naturalists in Newfoundland to this interesting subject? In the neighbourhood of Cow Head Harbour these drowned "mice" have been observed on the land-wash "by thousands."—
HENRY REEKS (ThruXTON, Hants).

ORNITHOLOGICAL NOTES FROM COBHAM.—As usual, in November and December, the gamekeepers here obtained a single female Merlin, which was found dead, having been probably slightly wounded by a shot. When I say as usual, I mean that for the last three years at the same season a single female Merlin has been obtained here, and in each case accidentally, the first two having been shot in mistake for Sparrowhawks. Previously to 1874 the female Merlin was unknown here, and the first specimen was not recognised by the head keeper, although he knew the male well. It would seem that the females of this species arrive along the Thames and Medway in October and November; the males are more commonly seen in March and April. I have never seen an old blue male except in these months, and if I have seen a male Merlin at all in December or January, it has generally been in very bad weather, when the Fieldfares, Redwings and Sky Larks begin moving about in search of food. As a rule, the female Merlin is as nearly as possible the same length as the male Sparrowhawk, viz., twelve inches, but the specimen obtained last year was nearer thirteen inches, and was very white on the nape, like a hen Sparrowhawk. The female Merlin is very distinct from the male on the wing. The extreme shortness of the latter, usually between ten and eleven inches, distinguishes him at once from all other British hawks. I have generally noticed, too, that the male is more given to that struggling, fighting manner of getting

through the air, which makes him look so very like a Missel Thrush in the distance. The female Merlin, on the other hand, is more graceful in her flight, though the motion of her wings in chasing a Lark over a stubble-field is sometimes inconceivably rapid. I have twice seen one chasing a Lark in this manner, though apparently not particularly anxious to catch it. On one occasion I saw a female Merlin dashing at two Partridges on the ground, and on my putting them up she instantly darted after them from a low bough on which she had been sitting. I have just said that the male Merlin does not usually exceed eleven inches in length. It is worthy of note, however, that I have seen black-backed birds from Egypt that must have been fully twelve inches long. The labels had been lost, and therefore the sex was not known for certain, but it seems possible that these may have been females assuming the male plumage, especially as they were not very rufous underneath. I may observe that the under side of the wings looks very white in the Merlin, thus affording a good mark of distinction at a distance. The male and female Kestrels keep very much apart. On December 20th I had not seen a female for many weeks, but on the 6th of that month I saw three males close together; and it is noticeable how often Kestrels and Hobbies go about in trios. I am glad to see by Mr. Rodd's letter that I am not singular in thinking that there are two races of black-clawed Kestrels, for the white-clawed Lesser Kestrel and Red-legged Falcon may more appropriately be termed "Kestrelets," as indeed they have been termed by a writer in '*The Ibis*.' The extremely small appearance of the male Kestrel when flying at a great height, with wings half closed and feathers close to its body, is remarkable. It looks then no bigger than a Swift, and the fawn-colour of the under parts looks almost black. The female Kestrel may be distinguished by being slightly longer, with a thicker head and neck and much whiter under parts. The rufous of the upper parts is also paler, and looks yellow in the distance. When old, it gets very gray on the rump and tail, and I got one this year in which all trace of rufous had vanished from those parts. Even in immature plumage the male may usually be distinguished by a deeper tone of colouring on the back and darker quills. In this stage he looks a curious coppery colour when sitting. Though more slenderly built, and as a rule a shorter bird than his mate, his wings do not seem any shorter in proportion, and he consequently looks longer-winged. The reverse is the case with the Merlin, the distinction in size being manifest in all the proportions. A son of one of the keepers here saw seven Sparrowhawks together near the village of Chalk. He knows the species well, and thought they looked like an old female and six young ones. I think this was in September. 1876 was a great year for them, and I have seen more female Sparrowhawks during the past autumn than I ever remember to have seen before. I saw one from Egypt the other day which measured sixteen inches, the extra length being chiefly in the

tail. It is somewhat remarkable that the Rough-legged Buzzard was unrecognized here until December 6th, 1876, the common species occurring almost every year about November 1st. On December 6th I went to a well-known haunt of the Common Buzzard to see if any were about, and I at once perceived two Buzzards hovering over a wood. I noticed several peculiarities in their appearance. Their heads were conspicuously light in colour, and their long wings and hovering flight gave them a somewhat aquiline appearance. Waiting about the place, I very soon had a good view of one which was being chased by a Hooded Crow, and presently settled on a low tree. I had now no doubt what they were. The whitish head, white basal half of the tail, whitish under side of the wings, dark band across the belly, and yellowish edgings to the upper plumage, all convinced me that they were the rough-legged species. Seen on the wing, the mottled plumage of the back presented a sort of marbled appearance, with alternate light and shade. Seen sitting, the yellowish edgings predominated, making the bird look like the light-coloured race of the Sea Eagle which is found in Egypt. The light under side of the wings, excepting one dark spot, is a very sure mark of distinction from the Common Buzzard. But, above all, the flight is unmistakably different. It is almost the difference between a Kestrel and a Sparrowhawk, the wings of *Archibuteo lagopus* being long and slightly pointed, instead of straight and round: this feature is very noticeable when the bird is flying away from you, the points of the wings being directed backwards. In the rapid beating of the wings, with alternate smooth glidings and shootings, the Roughlegged Buzzard resembles the Hawks and Falcons rather than the Buzzards. Sometimes even he will sweep along with curved wings almost like a Sea Gull. The head looks less heavy than in the common species. I am sorry to say that within forty-eight hours one of these fine birds was trapped at a Pigeon, which was supposed to have been killed by a Sparrowhawk. On the 18th and 19th December I saw the other. When disturbed he perched on the very top of a tall ash, from which he watched the intruder intently. While looking at the two Rough-legged Buzzards on December 6th they were joined by a third bird, uniformly brown in colour, and with shorter and rounder wing. This I have little doubt was a Common Buzzard. In November last I twice saw a Firecrest here, in company with Goldcrests among bracken. I noticed the black stripe through the eye, which readily distinguishes this bird from the commoner species.—CLIFTON.

EIDERS IN THE ESTUARY OF THE MOY, COUNTY MAYO.—On the 4th of March, 1870, when visiting the island of Bartragh with two friends, our attention was attracted by a pair of large ducks resting at low water on the edge of the channel near the bar. They appeared to be much larger than Mallards, and looked almost as dark as Scoters, with the exception of the front of the neck and upper part of the breast, which were white, and a

light-coloured patch on the back between the shoulders. They were very wary, and would not permit us to approach sufficiently close to identify them. I did not again see them until the 18th of April, when I observed them diving for food in the channel just opposite Moyview. They had a habit of retiring at low water to the lonely part of the channel near the bay to rest on the sand, and then, with the rising tide, returning to feed between Moyview and Castleconnor, and occasionally higher up the river, within a mile or two of Ballina. Until the 12th of May I was unable to satisfy myself as to what they really were; but on that day I obtained a close view of them from behind a wall at Killanly, while they were diving close to the shore, and I was then pretty sure that they were Eiders, a species which I had never met with here before. Being seldom on the water after the latter date, I did not see anything of these ducks until the month of July, when I observed one of them flying down the channel near Bartragh, and the salmon fishermen, to whom it was well known as the "big duck," told me they had remarked only one bird frequenting the river all the season, its companion having disappeared shortly after I had seen the pair together on the 12th of May. Early in September I saw the single bird again near Moy Fort, within a few hundred yards of the Shipping Quay; and on the 6th of October, as I was returning home from Ballina, I observed it swimming up a small bay ending in a narrow marshy creek near Killanly. It being a very high spring-tide, the creek was completely filled up to the mouth of the little stream, and if the duck got up the narrow part between the banks, it would be concealed from view of the road, and would probably rest there, for some time at least, while the tide was high. Being determined, if possible, to obtain this bird, having already failed so often in doing so, I hastened home for my boat; but as all the men were employed on a distant part of the farm I had no one to row. Not to lose a chance, therefore, two young ladies accompanied me in the boat, and we rowed up the little bay. We saw nothing of the bird until we got nearly to the head of the creek, when he appeared swimming down between the rushy banks. Before coming within shot, however, he dived, passing right under the boat, and did not show himself until outside of us, when he dived again, so quickly after rising to the surface that I found it extremely difficult to shoot him. However, after a smart and most exciting chase of nearly a quarter of a mile, he became rather blown, and being unable to dive so quickly as at first, I got a fair shot and knocked him over, not at all too soon, for my crew were getting exhausted. It proved to be an immature male Eider, and when presenting it to the Royal Dublin Society's Museum, I asked the taxidermist to ascertain whether there were any old wounds such as would account for the bird not migrating to its usual summer haunts. He afterwards assured me he had discovered no trace whatever of any wound beyond the recent shot-marks, and that the bird was in first-rate condition. In the month of December

following, my friend Capt. Dover shot a beautiful male Eider near Bartragh, and he thought it probably might have been the companion bird of the one I shot, which had disappeared from the river shortly after I had last seen them together on the 12th of May. Both specimens are now in the Museum of the Royal Dublin Society. The Eider Duck is of very rare occurrence on the Irish coast, and especially so on this part of it, these being the first of the species that I have met with, although I have been shooting on the estuary here every winter for many years past; and Thompson, in his 'Birds of Ireland,' mentions only three specimens of this bird as having been obtained in Ireland—one, a fine male, obtained near Ballbriggan, on the Dublin coast, in May, 1840, and two others shot on the Mayo coast in January, 1842.—ROBERT WARREN (Moyview, Ballina, Co. Mayo).

ORNITHOLOGICAL NOTES FROM ESSEX.—A considerable number of the Lesser Tern bred last season on the Landguard Fort Common, Felixstow. This no doubt is attributable to the protection now afforded them by Act of Parliament. Amongst the wading birds and sea-fowl shot during August and September last on the Dovrecourt beach, on the flats of the river Stour, the salt-marshes at Ramsay, and other places on the east coast, were Knots, Sanderlings, Green Sandpipers, Greenshanks, Curlew Sandpipers, Temminck's Stints, Red-necked and Gray Phalaropes. A Little Gull also was killed on the Dovrecourt beach on August 24th, and a Sandwich Tern on the Pye Sand on September 12th. On August 23rd two Kentish Plovers were seen, and one of them was shot on the beach at Dovrecourt. A Common Skua was obtained just outside Harwich Harbour on September 12th, and a female Eider Duck in the River Orwell on the 28th October. During the week ending November 4th a great number of Short-eared Owls were killed in the neighbourhood of Harwich. Between the 6th and 10th of that month seven Purple Sandpipers were shot on the stone breakwater, Harwich; while last, though not least, a Spoonbill was shot on the mud-flats of the River Stour on October 20th, by a wild-fowler named Porter, who unfortunately consigned the bird to the spit.—F. KERRY (The Bank, Harwich).

RARE BIRDS IN WILTS AND DORSET.—On the 22nd October last a Dotterell was observed on the downs in this parish by a parishioner whose accuracy I can vouch for: he whistled to it as it flew past him, and it settled some distance off in the same track he was pursuing, when he rose it a second time. The Dotterel is annually getting rarer, I am sorry to say, on our Wiltshire Downs; but they are still occasionally seen on the Plain near Salisbury, both in spring and autumn, though not so regularly or in such numbers of late years as formerly. But I am glad to be able to assert that they still form one of that group of comparative rarities in the ornithological catalogue which makes the broad downs of Wiltshire so attractive to the lover of birds, the Curlew, Thick-knee, Dotterel and Golden Plover still being found amongst us, while both the Great and Lesser

Bustard have visited us during the last ten years. In the previous month I saw a fine Hoopoe, which had been shot at Branksome Tower, near Bournemouth, on the 15th September: it was in the hands of Mr. Green, a birdstuffer there. I also obtained in the spring of last year, from the neighbouring parish of Broadchalke, a fine specimen of the Great Gray Shrike (*Lanius excubitor*), which had been killed in that parish in Easter week: it is, as far as I can judge, an adult female.—A. P. MORRES (Britford Vicarage, Salisbury).

THE TIME OF DAY AT WHICH BIRDS LAY THEIR EGGS.—I am inclined to think that birds lay their eggs rather earlier than has been stated, although not, as some affirm, in the middle of the night, and for this reason:—Some time ago I wished to see what time a certain Green Woodpecker laid, and for three mornings I went about 5.15, and an egg was always there. The next morning I went a little after four o'clock, when she flew out of the hole, but there was no egg; in another hour and a half, however, it had been deposited. Again, when out in the spring mornings about six o'clock, I nearly always noticed that nests previously found had each an extra egg in them.—C. MATTHEW PRIOR.

BENEFIT OF THE WILD BIRD PROTECTION ACT.—Mr. Edward Hart, the well-known naturalist, of Christchurch, informed me not long ago that in the spring of last year (1876), during May, there was a flock of some five hundred Bartaile Godwits in the Christchurch Estuary, which remained there for some ten days or a fortnight: they were all in full summer plumage, and presented to a bird-preserved a most enticing shot, but the Act duly protected them. He had been in the business, he told me, many years, and had lived at Christchurch all his life, more than thirty years, and had never seen a similar sight before. This in itself speaks volumes in behalf of the Act.—A. P. MORRES.

SCANDINAVIAN FORM OF THE DIPPER IN EAST YORKSHIRE.—In my communication to 'The Zoologist' on this variety of the Dipper (2nd ser. 1871) I expressed my opinion that the very few Dippers which had been procured in this district would probably turn out to be *Cinclus melanogaster*. Knowing that a Dipper had been shot at Easington, and preserved by Mr. Lawton, of that place, when in that neighbourhood a short time ago I called in to have a look at it, and my surmise, in this instance, turned out to be correct, as it is a fine specimen of the black-breasted Dipper. It was shot on the 24th October, 1874.—F. BOYES (Beverley).

ROLLER IN IRELAND.—We have much pleasure in being able to record what we believe to be the second instance of the occurrence of this bird in Ireland. A fine specimen has been forwarded to us for preservation, shot some miles from Carrick-on-Shannon. It was observed from the drawing-room window, pursued by a number of Magpies, when it was followed by the observer and shot. From being much injured internally, we were unable to

determine the sex, but believe it to be a female. The stomach contained the remains of numerous small beetles.—WILLIAMS & SON (Taxidermists, 2, Dame Street, Dublin).

[In Thompson's 'Natural History of Ireland' (i., p. 366), three instances of the reported occurrence of the Roller in Ireland are mentioned, but the author states that, at the date of the publication of his work, "no example of the bird, unquestionably killed in this island, had to his knowledge come under the inspection of the naturalist."—ED.]

MIGRATION OF THE PIED FLYCATCHER.—The individuals of this species which occur on our east coast during the autumnal migration are invariably described as being immature birds only. I think it very likely that observers may have been mistaken in this matter, as at this season the sexes, both mature and immature, are scarcely distinguishable. In his 'Birds of Northumberland and Durham' (p. 79), Mr. Hancock has very clearly pointed out the close resemblance in the plumage of the sexes in both the young and old birds. "They are," he says, "after the autumnal moult, all of the same obscure brown tint above; the males, however, may be known by the white band on the front of the head, by the white bar on the wing being broader than in the female, and by the basal portion of the tail being a little darker, and consequently by the white of this part being more conspicuous." The subject of the immigration of this species on the N.E. coast in the autumn is worth looking into by ornithologists and observers living in these districts.—JOHN CORDEAUX (Great Cotes, Ulceby).

PIED FLYCATCHER IN YORKSHIRE.—Until the summer of 1874 I was quite unacquainted with the Pied Flycatcher, never having seen or heard of this bird in Airedale. In that year, however, I happened to go into Wharfedale, which is separated from Airedale by three or four miles only of hilly moorland, "wildly majestic," and there to my surprise I found it breeding plentifully. In fact, it was commoner there than the Spotted Flycatcher. I saw no less than six pairs. This local distribution of the species strikes me as being somewhat remarkable.—E. P. BUTTERFIELD (Wilsden).

REPORTED OCCURRENCE OF THE GOLDEN EAGLE IN DURHAM.—The following note from a friend at West Hartlepool is dated November 15th, 1876:—"On Friday last a Golden Eagle was seen hovering about Seaton Carew, and was shot at by several persons. It afterwards went over in the direction of Throston Cars, and may have found its way to the Dene, as it was going in that direction." Now although the date is earlier, it is in all probability the same bird as that mentioned by Mr. Cordeaux (p. 9). I had almost resolved not to send you this note, for I am convinced that second-hand information is of very little value—at least, it will nearly always be found to be misleading. As an instance of this, I may mention that a young Eagle was said to have been shot at Seaton, near Seaham Harbour, about the 1st of November, and a paragraph relating the circumstance appeared

in the 'Durham Chronicle,' the size of the bird being also given—the expanse of wing put down at six feet seven inches. I happened to meet the writer of the paragraph, and in answer to questions I put to him, he stated that the bird was "spotted all over," whence I concluded it might be the Spotted Eagle. Starting for Seaham Harbour the next morning, I asked the birdstuffer to show me the bird in question, when he pointed to a case which contained a Rough-legged Buzzard, a young bird, and a very dark specimen, with scarcely a spot upon it. On my way home I heard of another Eagle that had been trapped at Colehill, some four miles from Castle Eden, my informant saying I might judge of its size when it took a three-dozen hamper to hold it, in which it had been sent off alive to a naturalist at Beverley. I hope this bird has come under the eye of Mr. Boyes, and I am much mistaken if it does not turn out to be a Buzzard also. It would appear that an unusual number of the larger birds of prey are just now paying us a visit, and the keepers, as usual, are doing their best to kill as many as possible.—JOHN SCLATER (Castle Eden, Durham).

SCARCITY OF THE WOOD PIGEON IN DURHAM.—I have previously remarked (Zool. 2nd ser. 4819) on the comparative scarcity of the Wood Pigeon in the neighbourhood of Castle Eden. The same remarks are applicable for the past year, and I wish to ask whether this bird has been observed to be less common in other parts of the country. Can it be that the Stock Dove is destined to take its place here?—ID.

[Our correspondent omits to say whether the Stock Dove has been observed to have become more numerous than formerly.—ED.]

ROOKS ATTACKING ACORNS.—I can corroborate, from personal observation, the Editor's remarks in the last number of 'The Zoologist' concerning the attacks on acorns by the Rooks. Close to this Vicarage are the grounds of Mr. F. J. E. Jervoise, in whose garden stand some ten or twelve fine old *Ilex* oaks, and it was only about a fortnight ago, in the middle of December, that I watched for some minutes a whole flock of Rooks busily engaged on the *Ilex* trees, flying from branch to branch, and balancing themselves as best they could on the extremities of the outer branches while they searched for or secured the coveted prize. It was a scene of wonderful bustle and activity; and I may mention that a couple of Jackdaws emulated the Rooks in their exertions. It is a common practice with them here, and the rookery being in the adjacent field I have often observed the same scene. I regret I have never accurately noticed what the Rooks did with the acorns—whether they actually swallowed them or not; on another occasion I will notice this point.—A. P. MORRES.

ROOKS ATTACKING ACORNS.—There are three oak trees close to our windows, one being not more than ten or twelve feet distant, the branches of which in autumn are covered with acorns. As long as I can remember Rooks have been in the habit of visiting them every season in order to pull

off the acorns, six or seven Rooks being often on the trees at a time, and occasionally quite a flock. On alighting on a branch a Rook seizes an acorn in its bill, and, if it is fast on and green, gives it a twist, and flapping its wings wrenches it off and flies away with it. I am of opinion that they eat the acorns, and do not carry them off to extract a worm, as Mr. Harting suggests, since I never found a maggot or worm in any of the acorns, though I have examined them with a knife over and over again. However, not having seen a Rook actually swallow an acorn, and not having shot any for the purpose of examination, I am unable to give direct and positive evidence as to the object of their attacks. I was always under the impression that the Rooks conveyed them away to some open field or exposed bank, as they do young potatoes, there to enjoy a meal without fear of being molested or disturbed, having at the same time something firm against which to peck the acorn or potato, as the case might be. Rooks, as a rule, do not swallow even small potatoes whole, but peck them in pieces. I was ignorant of the fact that the acorn has not been generally mentioned as the food of the Rook until Mr. Harting drew attention to it in 'The Zoologist.' There are several walnut trees not far from the oaks, but I never saw the Rooks on them, nor did they ever alight on the ground to pick up an acorn, but perhaps that may be accounted for by the trees being so near a dwelling house.—RICHARD M. BARRINGTON (Fassaroe, Bray, Co. Wicklow).

SPOTTED REDSHANK IN HAMPSHIRE.—Three years ago I heard that a specimen of this rare bird was killed in the meadows over here, but as I neither saw it myself nor learnt the name of the person who shot it, I considered the report doubtful. I am now able, however, to record a well-authenticated instance of its occurrence, a specimen having been shot on the 4th of September by a friend of mine. It was very much mutilated, but he gave it to me, and I spared no pains to make it a tolerable specimen. Messrs. Marshall and Stansell, of Taunton, came to see me the day it was killed, and they saw the bird in the flesh. Its weight was five ounces and a quarter, and the stomach contained two worm-like creatures, such as I believe I have seen upon the sea-shore—hence the bird could not have got them in this neighbourhood. The most noticeable characteristic about the appearance of this specimen is the white triangular markings on the outer web of many of the dark feathers on the wing-coverts and tail, which give them a scalloped looking outline; beside this the tail-feathers are barred very prettily with pale gray. The back is white, as well as the throat and cheeks—in fact, this colour extends to the top of the head, but is intersected by a conspicuous dusky streak which runs from the base of the upper mandible to the eye; crown of the head, back and sides of the neck, more or less gray; breast and belly white, dappled with shades of pale brown and gray. The bill is nearly two inches and a half long, and slender, of a dusky colour, except the base of the lower mandible, which is red.

The legs were red, long, and slender, being bare of feathers one inch and a quarter above the knee. I have been particular in describing this species, as I believe it is the first that has occurred in this neighbourhood, although it is reported to have been killed on more than one occasion in Christchurch Harbour. That this species, or any others which love the sea-shore, should sometimes wander up the course of the River Avon, is not to be wondered at, but its occurrence here may perhaps be worth noting.—G. B. CORBIN (Ringwood, Hants).

SINGULAR VARIETY OF THE COMMON GUILLEMOT.—On the 29th November last I was shooting about four miles out from Poole Harbour-bar, and amongst a lot of other birds I got a very singular variety of the Guillemot. Its bill and legs were of a bright yellowish red colour; the feet yellow also, with white nails. Mr. Hart, of Christchurch, who is setting up the bird, has sent me the following description of it:—Length, 18 inches 10 lines; breadth, 28 inches; bill, from forehead, 2 in.—from gape, 2 in. 11 lines; a streak running back from the eyes to a distance of $1\frac{1}{4}$ inch. Upper parts of bird, wings, tail, &c., dusky brownish black; secondaries tipped with white; under parts, white, &c.; legs, yellowish red; webs, dusky; nails, white. In fact, an ordinary full-sized Guillemot in winter plumage. Subjoined is a note from Professor Newton, which will no doubt be interesting to your readers:—" You are lucky to have obtained that very singular variety of the Guillemot. I have heard of a similar example before, but at this moment I only recollect one instance of it. This is noticed in the defunct German ornithological magazine 'Naumania' for 1857 (p. 437), by Dr. Krüper, who was informed by Pastor Jon Jonsson that such a bird was killed on the 13th July, 1843, at Grimsey, North Iceland. It is said to have been just like an ordinary Guillemot, but had a yellowish red (*gelbrothen*) bill and feet. The young is said to have had white feet, which would most likely have turned yellow with age."—T. M. PIKE (Westport, Wareham, Dorset).

[This singular variety of the Common Guillemot was exhibited by Prof. Newton at a meeting of the Zoological Society held on the 2nd January last, and attracted considerable attention from the ornithologists then present. The bird is in winter plumage, and, in the absence of any other explanation, the pale colour of the bill and legs must be regarded as a variation akin to albinism, or an absence of the normal colouring matter owing probably to some disease.—ED.]

SQUACCO HERON IN KILLARNEY.—The capture of this rare visitant at Killarney, on June 10th, 1875, having been only recorded in 'The Field' of June 19th, 1875, under initials, I beg to offer the following details, in order to establish its authenticity. I was fishing with a friend on the Lanne, a river connecting the Killarney Lakes with the sea at Castlemaine Harbour, and was just nearing a quiet and unfrequented part of the river where the Dunton Woods overshadow it, when my attention was attracted by what

appeared at a distance to be a snow-white bird rising out of a reedy marsh near the bank of the river. It flew with a slow and measured flight, passing so near as to enable me to see the pale buff of its back, though its wings were snowy white. I at once knew it must be a stranger. It pitched on a low tree overhanging the water, but having no gun with me I knew it was useless following it, though on my return I saw it standing on one leg on a sandy strand. On the 10th I lost no time in crossing the lakes and speeding down the Lanne, hardly expecting, however, again to see the rare stranger; but fortune favoured me, and on the same strand where I had last seen him standing I again found him. He allowed the boat to glide past within a few yards of him. I landed and walked up to him, but so careless was he of my approach that I had to allow him a few yards' law to avoid blowing him to pieces. I hurried into the stream and captured my prize, to find him a beautiful specimen of the Squacco Heron (*Ardea comata*). A boy herding cattle in the neighbourhood told me he had noticed the bird for some time past. I sent it for preservation to Mr. Thomas Cooke, of Museum Street, London, by whom it was beautifully mounted, and in whose shop it was seen and admired by many ornithologists. It is for the present deposited in the Ornithological Gallery of the Museum of the Royal Dublin Society.—ARTHUR H. BOWLES (99, Lower Mount Street, Dublin).

[The Squacco Heron seems to be a rare bird in Ireland. A specimen was shot many years ago near Youghal, as recorded by Thompson (*Nat. Hist. Ireland, Birds*, vol. ii. p. 158), and another, also procured in the neighbourhood of Youghal, is in the Museum of the Royal Dublin Society. So far as we are aware, the subject of the present notice makes the third now recorded to have been met with in the Sister Isle. Seeing that the true home of this species is South-Western Asia, Egypt and Nubia, it is rather singular that the only specimens met with in Ireland should all have been found in the south-west of the island.—ED.]

PALLAS' SAND GROUSE IN IRELAND.—No small interest attaches to the appearance of this bird in Ireland, as recorded at p. 24. Previous to its sporadic occurrence in the year 1859 it was unknown as a European bird; the remarkable irruption of more than 700 specimens in 1863, so ably chronicled by Professor Newton ('Ibis,' 1864, pp. 185—222), occurred over a vast area, but has never since been repeated. Now that it has at last reappeared so far west as Kildare, it is extremely probable that this curious Asiatic species has been met with in other places, and it behoves every naturalist to record every authentic instance of its occurrence. The uncertainty which surrounds every question of migration can only be dispelled by diligent colligation of facts.—HENRY T. WHARTON.

MAGPIES FLOCKING IN WINTER.—In 'The Zoologist' for November (2nd ser. 5164) I observe Mr. E. P. P. Butterfield laments the wholesale slaughter of Magpies, and their extinction in so many districts. I have great pleasure

in stating that in North Oxfordshire, at least, the day of their extirpation is far distant. In a single walk I have often seen as many as ten, and sometimes many more. In the winter they associate in flocks of from five to thirty-four; I never saw more together than the latter number at one time. There is very little game preserving here, owing to the want of arable land, and therefore Magpies have ample inducement to remain.—C. MATTHEW PRIOR.

MIGRATION OF BIRDS AT HELIGOLAND.—With reference to the notes from Heligoland included in my paper in the January number of 'The Zoologist,' Mr. Gätke has subsequently informed me that the *Phylloscopus* included with a query (Oct. 24th) was seen by him at close quarters in his garden, and that beyond a doubt it was *Phylloscopus fuscatus*, a species which has occurred before in Heligoland. On November 4th Mr. Gätke saw another rare visitor, but not having a gun at hand was unable to procure it; this was *Parus Kamschatkensis*, with the back entirely of a light bluish ashy gray colour—the very image, as he says, of Mr. Dresser's figure in 'The Birds of Europe.' There is a typographical error in my paper, p. 10, twenty-ninth line, under the head of Great Gray Shrike—for "Mr. Boyes mentions *ten*" read "Mr. Boyes mentions *two*" of these birds.—JOHN CORDEAUX.

FOOD OF THE DARTFORD WARBLER.—*Apropos* of Mr. Tyacke's note on the Dartford Warbler (p. 23), I may remark that this bird generally feeds its young on the body of a large yellow moth. I have observed several pairs carrying a light substance in their mouths to the nest, and on shooting one bird from each of two nests, I discovered that the food was the same in both cases. The wings of the moth were removed, and I was not entomologist enough to name the species, but I observed that the birds hunted for their prey among the lower part of the stems of the furze. During the summer Dartford Warblers may generally be found in most of the large patches of furze that are scattered over the South Downs, although, being remarkably shy, they are liable to escape observation, for on the slightest sign of danger they immediately seek the shelter of the bushes. In the winter they seem to be of a roving disposition. I have met with them several times amongst the stunted thorn-bushes and straggling furze on the beach between Eastbourne and Pevensey, and, when rabbit-shooting further inland, I have seen them occasionally driven out by the beagles from cover, where no one would ever expect to find them.—E. T. BOOTH (Dyke Road, Brighton).

MODE OF PROGRESSION OF THE PUFFIN.—Your correspondent, the Rev. Julian G. Tuck, says (2nd ser. 4958) he should be glad to know if any readers of 'The Zoologist' have observed the power of the Puffin not only to stand erect on its feet, but also to walk on the rock with apparent ease. I have observed this many times when lying on the top of the cliffs at Flamborough; and indeed it must of necessity be so, otherwise how could these birds reach the holes in which they breed? They alight on the ledges, perhaps a yard or more from the entrance of the cleft in the rock in which

they may have their eggs or young, and then deliberately walk along the edge and into the said cleft or fissure. These large rents in the rock afford shelter for a number of Puffins. I remember on one occasion noticing a crack in the road quite close to where I was lying. It had only a narrow entrance, and two Puffins, apparently young birds, were continually looking out, waiting, no doubt, for the old ones to bring them food, for I believe the young do not leave the rock until fully fledged. During the time I stayed several Puffins pushed themselves past these two and walked inside. These birds frequently breed on the highest part of the cliffs. There are certain places where you can creep to the very edge of the cliffs and watch the birds come up almost close against you : and I have noticed that if they miss their foothold on reaching the ledge on which they intended to alight, they have apparently no power to raise themselves any higher to regain it or try any other ledge, but turn round and sail out to sea again, some of them dropping a considerable distance before being able to recover themselves ; so that it is the impetus they have gained which carries them upward, and having reached their highest elevation their dead weight quickly brings them down again, unless they happen to reach the ledge. This is the case, I think, with all the *Alcidae*.—F. BOYES (Beverley).

NESTING OF THE BRAMBLING IN PERTHSHIRE.—Treating of the Brambling, in his new edition of Yarrell's 'History of British Birds,' Professor Newton says (vol. ii., p. 77), "They are not known with certainty to have bred with us except in captivity." And again, "A long search in various publications fails to shew that it is often seen later than the middle of March, by which time it has usually left Britain ; one must therefore receive with caution the statements which have been made as to its breeding in England." Under these circumstances, it is with much pleasure that I now bring to the notice of naturalists an undoubted instance of this bird nesting in Scotland. In the summer of 1866, while fishing on the river Lyon, in Perthshire, I had occasion to climb a beech tree to release the line which had become entangled in the branches, and while so engaged a female Brambling was disturbed from her nest, containing three eggs, which was placed close to the stem of the tree. As I was anxious to procure the young, I left her, and on again visiting the spot in about a fortnight the nest was empty ; and, judging by its appearance, I should be of opinion that the young birds had been dragged out by a cat. I have mentioned this fact in the recently published Catalogue of my collection of British Birds.—E. T. BOOTH (Dyke Road, Brighton).

CORRECTION OF AN ERROR.—In the editorial note appended to Mr. Gatcombe's communication on the Blue Shark off Plymouth, it was stated, through a typographical error, that this shark is "not common during the pilchard season off the Cornish coast." The words should have been "not uncommon," &c.

ON THE NATURALIZATION OF THE EDIBLE FROG (*Rana esculenta*) IN NORFOLK.—In 1859 I announced in 'The Zoologist' (1st ser. 6538—6540) the discovery in 1853, by my brother Mr. Edward Newton and myself, of a colony of Edible Frogs in Norfolk, and at the same time I was satisfactorily able to account for its existence. The colony was afterwards sought for by Mr. Southwell, but in vain; and nothing had been heard for many years of the colonists or their descendants. It was therefore with great pleasure that on the 30th of May last, when I happened to arrive at a small station on the Thetford and Watton Railway, my ears were greeted by some well-remembered notes, which I found to proceed from a little pond only a few yards off, and I soon gained a sight of some of the performers. I was fortunate in being in Lord Walsingham's company at the time, and he, entering at once into the interest of the matter, contrived after many unsuccessful attempts to bring to land a single example of the species, which is now in the Norwich Museum. On enquiring of a man who came from a house close by, he said that he had known these noisy Frogs so long as he had lived there—more than a dozen years, and by his means other examples were soon after sent to Mr. Southwell at Norwich. On reference to my former note, it will be seen that this species has thus made good its existence in Norfolk for at least *thirty-four* years, and I cannot doubt that the last colony I found is one of the results of Mr. Berney's original importations, as that gentleman has informed me that he has not introduced any more in the meanwhile, and I know of no one else who is likely to have done so. From Lord Walsingham I have since learnt that he has ascertained that the species is pretty generally diffused in a south-westerly direction from the place where we found it, and therefore its naturalization in the county seems to be accomplished.—ALFRED NEWTON (Magdalene College, Cambridge).

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

December 21, 1876.—Prof. ALLMAN, President, in the chair.

Mr. Thomas Christy (64, Claverton Street, S.W.) and Mr. Robert Drane (Queen Street, Cardiff) were balloted for and duly elected Fellows of the Society.

The Butterflies of Malacca formed the subject of a paper by Mr. A. G. Butler, of the British Museum. A number of new species were described, and a tabular view of the geographical relations given. The author states that of 258 species now registered from Malacca, 36 are endemic; of the remainder 65 also belong to Assam or Nepal, 38 to Moulmein, 33 to Ceylon, 94 to Penang, 46 to Singapore, 112 to Borneo, 41 to

Sumatra, 87 to Java, 39 to Siam, 26 to China, 2 to the New Hebrides, and 6 to Australia. Thus Malaccan butterflies preponderate towards those of the Indian Region.

Two short notices on Hornbills were read. *Craniorrhinus Waldeni* is the name of a new Hornbill from the Island of Panay, one of the Philippines, and described by Mr. R. Bowdler Sharpe, who regards it as allied to *C. cassidix*. The specimen was obtained by Professor Steere (Univ. Michigan, U.S.) in a virgin forest in the mountainous ranges of the above island; the birds keeping high among the branches of dense-foliaged trees, only one specimen was procured. An extract from a letter from Dr. John Anderson contained some observations on *Hydrocissa albirostris* and *Aceros subruficollis*. These Hornbills are kept in the Aviary of the recently-founded Zoological Gardens of Calcutta, and, to the surprise of the writer, he observed that they devour small birds head foremost. They commence by tossing them about and breaking every bone of the body by passing the victim through their bill from side to side.

The genital armature in the European *Rhopalocera* formed the subject of some researches by Dr. Buchanan White. This entomologist, after a careful comparison of the external genital apparatus, holds that the parts in different genera and species exhibit such diversities as, in his opinion, to afford good distinguishing characters.

A new Crustacean, from Australia, *Actaeomorpha erosa*, was described by Mr. E. J. Miers. It was dredged at seven fathoms, and came up along with a number of *Cancroidea*, &c. To these, indeed, it bears so close a resemblance as at first to be mistaken for one of them, though subsequent examination has shown that structurally it undoubtedly belongs to the family of *Leucosiidae*.

Mr. H. N. Moseley, one of the naturalists on board of H.M.S. 'Challenger,' having procured two new and remarkable forms of deep-sea Ascidians, gave a detailed account of their appearance and anatomical peculiarities. The first of these aberrant forms, named by the author *Hybythius calcycodes*, was trawled in the North Pacific Ocean from a depth of 2900 fathoms. It is cup-shaped and stalked, and probably is allied to *Boltenia*; but it differs from this well-known genus, among other things, in possessing a series of cartilaginous plates, developed with symmetrical arrangement on its otherwise soft test. The second still more bizarre Ascidian has received the name of *Octacnemus bythius*, and this was raised from a depth of 1070 fathoms. Star-shaped, or of 8-rayed contour, its gill-sac is nearly horizontal, and gill network absent. Muscular prolongations of the tunic run into the curious conical protuberances of the test; the nucleus is contracted and small like that of *Salpa*. So far as present knowledge goes, this unique specimen is believed to be without living allies.

Mr. A. G. H. Doran communicated, through Prof. Flower, an extensive memoir on the small ear-bones, or *ossicula auditus*, of the Mammalia, the specimens referred to being deposited in the Osteological Gallery of the Museum of the Royal College of Surgeons. While dealing with these usually diminutive bones *in extenso*, the author more particularly confined himself to summarising the most noteworthy facts relative to those of the *Insectivora*, *Cheiroptera*, *Cetacea*, *Sirenia*, *Edentata*, *Marsupialia*, and *Monotremata*. In the first of these groups, the three little bones (hammer, anvil, and stirrup) present no positive or marked characteristic. Among the Bats there is a resemblance to what obtains in the Shrews, except in the genus *Pteropus*, where the malleus or hammer is of a lower type. Of Whales, *Balaena* has the most generalized type; the Dolphins have relatively stout stirrup arches and other marked features; the Gangetic Dolphin (*Platanista*) has slightly modified ossicula. Those of the Manatee group (*Sirenia*) are at once known and distinguished by their relatively great weight and their shape. The *Edentata* not only differ as a whole, but among the *Armadillos* distinctions of the ossicula exist, and Sloths and Ant-Eaters are known by special characters of their own. The Pouched Mammalia (*Marsupialia*) show a low grade in their small ear-bones; and a still lower form, approaching to that of birds and some reptiles, is evinced in the *Echidna* and Duck-billed Platypus (*Ornithorhynchus paradoxus*). The author's investigations and comparisons lead him to believe that even in such parts as these inner ear appurtenances generic and family characters are apparent, and that these are of some value when considered in connection with other features of a more distinctive character.

Two botanical papers were read, of which we need only append the titles, namely, a "Note on the Uses of a Commercial Cane termed 'Whangee,' a Species of *Phyllostachys*," by Mr. John R. Jackson, of Kew; and "Some Morphological Notes on certain Species of *Thunbergia*," by Mr. Marcus Hartog, of the Royal Botanic Gardens, Ceylon.

ZOOLOGICAL SOCIETY OF LONDON.

January 2, 1877.—Prof. NEWTON, F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of December, and called attention to a Snowy Owl captured in Ireland, presented by Mr. John Kendall, and to the recent abundance of specimens of this bird.

Prof. Newton exhibited and made remarks on a specimen of a variety of the Guillemot (*Alca troile*), with yellow bill and legs, which had been lately shot by Mr. T. M. Pike on the coast of Dorset.

Prof. Garrod read a paper on the osteology and visceral anatomy of the *Ruminantia*, in which many facts concerning the anatomy of the *Cervidae* and the *Caricornia* were brought forward, especially with reference to the shape of the liver and the structure of the generative organs in these animals. Among the most important of these was the observation that the uterine mucous membrane of the Musk Deer (*Moschus moschiferus*) presents no indications of the presence of cotyledons, the contrary being the case in all other Ruminants. Professor Garrod likewise made a suggestion as to a proposed method of expressing the relations of species by means of formulæ.

A paper by Messrs. Sclater and Salvin was read, containing the descriptions of eight new species of South-American birds, namely, *Euphonia Finschi*, *Pheuticus crissalis*, *Octhæca leucometopa*, *O. arenacea*, *Chloronerves dignus*, *Celeus subflavus*, *Chamæpelia Buckleyi*, and *Craæ erythrognatha*.

Mr. R. Bowdler Sharpe read a paper on some new species of Warblers from Madagascar, which had been recently added to the collection in the British Museum, and were proposed to be called *Apalis cerviniventris*, *Baocerca flaviventris*, and *Dromæocercus brunneus*, the last-named being a new genus.

A communication was read from Mr. G. S. Brady, containing notes on Freshwater Mites which had been obtained from lakes and ponds in England and Ireland.

January 16, 1877.—Prof. NEWTON, F.R.S., Vice-President, in the chair.

Capt. H. W. Feilden exhibited and made remarks on some of the birds collected by him in the Arctic Regions during the recent North Polar Expedition. Sixteen species were enumerated as having been met with on the shores of the Polar Basin, and north of 82° N.L., but some of these only occurred as stragglers.

The Rev. Canon Tristram exhibited and made remarks on a specimen of a rare terrestrial Dormouse (*Eliomys melanurus*), obtained by him in Southern Palestine, where it is found in desert places.

Mr. P. Sclater exhibited and called attention to a collection of Mammals, Birds, and Insects, which had been made by the Rev. George Brown during his recent residence in Duke of York Island, and during excursions to the neighbouring Islands of New Britain and New Ireland.

Prof. A. H. Garrod read a note on a variety of the Domestic Swine in the Society's collection, and pointed out that the presence of rudiments of a supplementary digit between the third and fourth digit might be the cause of the consolidation of the hoof, observable in this variety.

A communication was read by Mr. Henry Durnford containing notices of the habits of some small mammals obtained in the neighbourhood of Buenos Ayres.

A communication was read from Mr. Gerard Krefft, containing notes on a young Cassowary (*Casuarius australis*), which had been obtained from North Australia, and was destined for the Society's Collection.

A communication was read from Mr. G. French Angas, containing a description of a new species of *Helix* from South Australia, which he proposed to call *Helix (Rhagada) Kooringensis*.

A second paper by Mr. Angas contained the description of two genera and twenty species of marine shells from different localities on the coast of New South Wales.—*P. L. Sclater.*

ENTOMOLOGICAL SOCIETY OF LONDON.

December 6, 1876.—Sir SIDNEY SMITH SAUNDERS, C.M.G., Vice-President, in the chair.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:—‘Proceedings of the Royal Society,’ nos. 173 and 174; presented by the Society. ‘The Zoologist’ and ‘Newman’s Entomologist’ for December; by T. P. Newman. ‘Entomologist’s Monthly Magazine’ for December; by the Editors. ‘The Naturalist; Journal of the West Riding Consolidated Naturalists’ Society,’ no. 17; by the Society. ‘Nature,’ nos. 366—370; by the Publishers. ‘A Monographic Revision and Synopsis of the Trichoptera of the European Fauna;’ by the Author, Robert McLachlan. ‘British Gall Insects;’ by the Author, Albert Müller, of Basle. ‘The Canadian Entomologist,’ vol. viii., nos. 9 and 10; by the Editor. ‘L’Abeille,’ no. 182; by the Editor. ‘La Famille des Ephémérines,’ par le Rev. A. E. Eaton, traduit de l’Anglais; by the Translator, Dr. Emile Joly. ‘Tijdschrift voor Entomologie,’ 3e & 4e Aflevering, 1875-6; by the Entomological Society of the Netherlands. ‘Entomologische Monographieen,’ von Dr. Fr. Klug; presented by Edward Sheppard, Esq. ‘Die Schmetterlinge Deutschlands und der Schweiz,’ Band ii., Heft 2; by the Authors, H. v. Heinemann and Dr. Wocke. ‘Genera Cimicidarum Europæ,’ dispositus O. M. Reuter; ‘Capsinæ en America boreali in Museo Holmiensi asservatae,’ descriptæ ab O. M. Reuter; ‘Bidrag till Känndomen om Syrphus flugornas larfver och puppor,’ af Filip Trybom; ‘Species Tortricum et Tinearum Scandinaviæ,’ enumeravit H. D. J. Wallengren; ‘Insecta Transvaaliensia, Bidrag till Transvaalska Republikens i Södra Afrika Insekt-fauna,’ af H. D. J. Wallengren; ‘Tvenne för Skandinaviens Fauna nya Pyralider,’ af H. D. J. Wallengren; by the Royal Swedish Academy of Sciences of Stockholm.

Election of Members.

M. Eduard Gruhé, Director of the Zoological Collection in the University of Breslau, and Dr. Katter, of Putbus, in the Island of Rügen, were balloted for and elected Foreign Members. Lord Dorner, formerly a Subscriber to the Society, was re-elected a Subscriber.

Exhibitions, &c.

Mr. McLachlan (on behalf of Mr. W. Denison Roebuck, of Leeds) exhibited some locusts, a swarm of which had been observed to pass over Yorkshire during last autumn. He had examined the specimens carefully, and had compared them with the descriptions of the two species which occasionally visited this country, *viz.*, *Pachytylus migratorius* and *P. cinerascens*; and he had come to the conclusion that the specimens belonged to *P. cinerascens*, which he remarked was supposed to breed in some parts of the north of Europe, and therefore might be expected more frequently in this country.

Mr. W. C. Boyd exhibited living larvæ of *Brachycentrus subnubilus*, in their quadrilateral cases, reared from the eggs. They were of much larger size than those previously exhibited by him at the November meeting in 1873, being more than half an inch long.

Mr. S. Stevens (on behalf of Mr. Edwin Birchall) exhibited a specimen of *Cirrhœdia xerampelina*, *var. unicolor*, *Agrotis Luciferna*, *var. latens*, and what appeared to be a small *var.* of *Zygæna filipendulae*, with the pupa-case and cocoon. They were all taken by Mr. Birchall in the Isle of Man.

Mr. Meldola referred to a request made by Mr. Riley at the meeting in July, 1875, that entomologists would supply him with the cocoons of the parasite, *Microgaster glomeratus*, which were much wanted in America to destroy the numerous specimens of *Pieris rapæ* which had been imported into that country. Mr. McLachlan had at a subsequent meeting stated that *M. glomeratus* was parasitic on *P. brassicæ*, but doubted if it ever attacked *P. rapæ*, and Mr. Meldola now exhibited the insects he had found parasitic on these two species—that on *P. rapæ* being *Pteromalus imbutus*, *Waltl.* (one of the Chalcididae), while on *P. Brassicæ* he had observed *Microgaster glomeratus* and a Dipteron species, *Tachina angusta*. Specimens of all of them were exhibited. Mr. E. A. Fitch remarked that Van Vollenhoven had obtained *Pimpla examinator* from *P. Napi*.

Mr. Smith stated that he had received a nest of *Osmia muraria*, sent to him from Switzerland. The cells were empty, the Osmiae having taken their departure, but one closed cell was observed to contain a yellow larva, which ultimately proved to be that of a beetle belonging to the Cleridae, *Trichodes alvearius*.

Mr. Hamilton James, of Truro, forwarded a photograph of a specimen of *Deiopeia pulchella*, taken on the 12th October last at Portscatter, near Falmouth, stating that it was considered a very rare insect in Cornwall.

Sir Sidney S. Saunders exhibited a large box of insects of all orders, which had been collected in Corfu by Mr. Whitfield, and were now for sale.

Sir Sidney Saunders also exhibited several larvae of Meloidæ in their first stage, received from M. Jules Lichtenstein, of Montpellier, consisting of—

1. The primary larval form of *Sitaris Colletes* (*Mayet*), found on *Colletes succincta*, feeding on ivy-blossoms in September, the former described by M. Valéry Mayet in the 'Annales' of the French Entomological Society, 1875.

2. The same larval stage of *Mylabris melanura* obtained from the egg, which M. Lichtenstein had not succeeded in rearing to the second stage. Like other larvæ of Meloidæ in their primary form, it is furnished with triple tarsal appendages. A description of this larva will appear in the aforesaid 'Annales.'

3. The exuviae of the primary larva of *Meloë cicatricosus* (from the egg), and also the second stage of the same larva, still bearing legs.

4. The primary larva of *Meloë proscarabæus* (?), differing from the foregoing in the structure of the antennæ. Taken on an *Andrena*.

5. The corresponding larval stage of *Meloë autumnalis* (?), also differing as aforesaid. Taken on *Scolia hirta*.

Also specimens of the Phylloxera of the vine in various stages, consisting of—*a*. The root-type; *b*. The leaf-gall type; *c*. The winged stage; *d*. The male of the apterous sexual race.

Mr. C. O. Waterhouse made some remarks on the 'Catalogus Coleopterorum' of Gemminger and v. Harold, the concluding volume of which was now published. The total number of generic names given is 11,618, of which 7364 are adopted genera, and 4254 appear as synonyms. The total number of species recorded is 77,008. Dejean's first Catalogue, published in 1821, gave 6692 species, while that of 1837 (the third edition) gave 22,399 species, of which, however, only a portion were then described. Taking into consideration the number of species described during the publication of the Munich Catalogue, the number of described species at the present date could not be less than 80,000. Thus, since 1821, the known species of Coleoptera had increased twelvefold.

Mr. C. O. Waterhouse read "Descriptions of Twenty New Species of Coleoptera from various Localities."

Annual Meeting, January 17, 1877.—Sir SIDNEY SMITH SAUNDERS, C.M.G., Vice-President, in the chair.

An Abstract of the Treasurer's Accounts for 1876 was read by Mr. Dunning, one of the Auditors, showing a balance of £6 8s. in favour of the Society.

The Secretary then read the Report of the Council for 1876.

The following gentlemen were elected Members of Council for 1877:—Sir Sidney Smith Saunders, Professor Westwood, Rev. A. E. Eaton, Rev. T. A. Marshall, and Messrs. H. W. Bates, G. C. Champion, J. W. Douglas, J. W. Dunning, F. Grut, R. Meldola, E. Saunders, H. T. Stainton, and J. Jenner Weir.

The following officers were subsequently elected for the year 1877:—President, Professor Westwood, M.A., F.L.S., &c.; Treasurer, J. Jenner Weir; Hon. Secretaries, Messrs. F. Grut and R. Meldola; Hon. Librarian, Rev. T. A. Marshall.

The President (Prof. Westwood) having been unfortunately prevented from attending by an accident, the reading of his Address on the progress of Entomology for the past year was unavoidably postponed until the next meeting, on the 7th February.

A cordial vote of thanks was given to the President, with an expression of regret at the cause of his absence on this occasion. A vote of thanks was also given to the Treasurer and Secretaries.—*F. G.*

NOTICES OF NEW BOOKS.

The Geographical Distribution of Animals. By ALFRED RUSSEL WALLACE. Two Vols., 8vo. London: Macmillan & Co. 1876.

IN the Preface to this important work the author describes it as “an attempt to collect and summarise the existing information on the distribution of land animals, and to explain the more remarkable and interesting of the facts, by means of established laws of physical and organic change.”

Of living naturalists Mr. Wallace is probably the one best fitted, by his training and experience, to deal with the subject which he has undertaken: he is familiar with the aspects of life in three of the richest zoological provinces of the world,—namely, South America, and the Indo- and Austro-Malayan Archipelagos,—and those who know him personally are aware that the geographical distribution of animals has been a study with him for the last twenty years. The two published volumes which embody the result of his labours are divided into four parts, *i.e.*, the Principles and General Phenomena of Distribution; the Distribution of Extinct Animals; Zoological Geography; and Geographical Zoology.

It would be impossible, within the limited space at our disposal, to discuss in detail the different subjects dealt with in the twenty-three chapters into which the work is divided, and we must content ourselves with presenting to our readers a faint outline of the general argument.

Mr. Wallace is of opinion that the existing continents and deep oceans are of great geological antiquity; that during the eocene period the bulk of the land was on the northern side of the Equator; and that in that hemisphere the struggle for existence was more severe than in the southern hemisphere. Consequently the highest and most specialized forms of animal life are to be found north of the Equator. In supporting his views, with much sound reasoning, Mr. Wallace has adopted the six zoological regions first proposed by Mr. Sclater in 1857, and these are now generally accepted as natural divisions of the earth's surface. With the exception that Mr. Sclater's Indian Region is altered by Mr. Wallace, in name only, to the Oriental Region, no other important change is suggested. The six regions accordingly stand as the Palæarctic, the Ethiopian, the Oriental, the Australian, the Nearctic, and the Neotropical; each being divided into four subregions.

The only subregion in which no mammals exist, except Bats, is New Zealand; and Mr. Wallace explains this fact by supposing that New Zealand has not been connected with any other part of the earth's surface since the creation of the *Mammalia*. The great region of Australia is almost destitute of placental mammals, showing, according to our author, a very ancient isolation of that part of the world.

The various cases of the existence of isolated forms in South America and South Africa are also explained by the supposition that these regions, separated in remote geological times, were large islands, and the struggle for existence there not having been so severe as in the northern hemisphere, low forms of *Mammalia*, such as the *Edentata*, *Caviidæ*, and others have survived to the present day. We are very much disposed to accept this reasoning, and it well explains the existence of such low forms of birds as *Apteryx* in New Zealand, the *Tinamidæ*, *Dicholophus*, and others in South America, *Rhinocætus* in New Caledonia, and such an aberrant form of the *Accipitres* as *Serpentarius* in Africa.

In the opinion of Mr. Wallace, the present state of the globe is one of zoological depauperization, caused by the glacial period.

It was probably owing to the separation of North from South America, at that period, that the complete extinction of the *Proboscidea*, *Equidae*, *Rhinocerotidae*, and other *Ungulata* was there effected. These animals were probably driven south by the cold, and, not having a large southern continent to retreat to, were completely exterminated. The existing *Tapiridae* are the only descendants amongst the *Perissodactyla* that exist in the Neotropical Region at the present day, none being now found in the Nearctic Region.

Amongst insects, Mr. Wallace has wisely confined his attention to the groups best known, as the Rhopalocerous *Lepidoptera* and the more showy amongst the *Coleoptera*, because these alone have been sufficiently studied to afford adequate material for generalization. Mr. Wallace has a singular power of suggesting an explanation of a difficulty, and this is well shown in his observations on the occurrence of numerous insects in South Temperate America which belong to genera found otherwise in north temperate regions only. Amongst the diurnal *Lepidoptera*, for instance, species of the genera *Hipparchia*, *Argynnис*, and *Colias*, and several genera allied to *Erebia*, are found in South Temperate America, and form a sufficiently remarkable group of northern forms, to render an explanation of their origin necessary. Mr. Wallace, indeed, admits that both in diurnal *Lepidoptera* and in *Carabidae*, the northern element is fully equal to the tropical, if it does not preponderate over it. The whole of his argument is too long to be here extracted, but he points out that the great mass of neotropical butterflies are forest species, and for countless ages have been developed in a forest-clad tropical country. The north temperate butterflies, on the other hand, are for the most part species frequenting the open country, haunting pastures, mountains, and plains, and often wandering over an extensive area. These would find in the higher slopes of the mountains vegetation and conditions suited to them, and would occupy such stations in less time than would be required to adapt and modify the forest-haunting groups found in the American lowlands. It should not be forgotten, also, that along the higher regions of the Andes there is an almost continuous temperate region, which would provide for the animals of Northern Temperate America a district along which they could pass through Tropical America into the cooler regions of the south.

Some naturalists are of opinion that the time has not yet arrived for the production of a book of such high aim as that now under consideration. It must be admitted that systematists are sadly behind-hand in the arrangement of many classes of Vertebrates, the classification of birds, for example, being in almost as confused a state as ever; but we can see no reason why the present generation of philosophical naturalists should be condemned to exist in a state of zoo-geographical ignorance. In a concluding paragraph Mr. Wallace expresses a hope that his work may bear to the eleventh and twelfth chapters of Mr. Darwin's 'Origin of Species' the same relation which that author's 'Animals and Plants under Domestication' bears to the first chapter of that work. It appears to us that the standard of excellence aimed at in the present undertaking has been satisfactorily and ingeniously attained.

Life of a Scotch Naturalist: Thomas Edward. By SAMUEL SMILES, Author of 'Lives of the Engineers,' 'Self Help,' &c. 8vo, pp. 438. London: Murray, 1876.

WHO is Thomas Edward, to whom the Queen has been pleased to grant a pension of fifty pounds per annum? and what has he done to merit such distinction? are questions which many persons no doubt have asked themselves on reading in the newspapers the recently-published letter of the Prime Minister. The answer is to be found in the book before us, and we have little doubt that to the majority of readers the story will be as little known as the name of its hero.

To readers of 'The Zoologist,' however, the name of Thomas Edward will be familiar, as that of a frequent contributor to the pages of that journal, and a genuine out-door observer and field naturalist, who in a quiet, humble way, has done much to further the progress of his favourite science.

A shoemaker by trade, at Banff, and a poor man, he had not the means to inform himself as others with similar tastes have done. With an intense love for Natural History, and a perpetual thirst for knowledge, "he endured," says his biographer, "as much hardship for the cause of Science as soldiers do in a prolonged campaign." He always lamented his want of books, and in the

course of his collecting had frequently to send his specimens to other naturalists to be named, and thus he often lost them.

"Edward," we are told, "had to begin at the beginning with everything." He did not possess a single work on Natural History. He did not know the names of the birds and animals that he caught, or of the plants which he collected. For many years after he had begun his researches his knowledge of natural objects was obtained by chance. He knew little of the nature and habits of the creatures that he went to seek; he scarcely knew where or how to find them. Yet his very absence of knowledge proved a source of inexhaustible pleasure to him. All that he learnt of the form, habits, and characteristics of birds and animals was obtained by his own personal observation. Besides his intense love of Nature he possessed invincible determination, and this gave him an immense advantage. Whatever object in Natural History he desired to possess, if it were possible to obtain it, he never rested until he had succeeded. He sometimes lost for a time the object of which he was in search, because he wished to study its habits: for this purpose he would observe long and patiently before obtaining it, by which means he acquired an amount of information such as no book on Natural History could have supplied him with.

Dependent for an income upon his trade, he worked at it the livelong day, but early dawn and gathering twilight saw him far afield in eager search of natural living objects, while snatching his sleep at intervals between departing night and returning day. Occasionally, when kept late at work, he was prevented from enjoying his evening ramble. After going to bed, and taking a short sleep, he would set out in the dark in order to reach a particular spot by daylight, whence he would work his way homeward as the hour for business approached. Sometimes in his enthusiasm he would remain out all night, sleeping in a fox's or badger's "earth" which he had enlarged for the purpose: nor did he scruple to avail himself of a dry ditch, or even to lie upon the bare ground, when the exigencies of the case seemed to require it. How he managed to escape severe illness is a mystery; his constitution, it may be said, seemed "made to last." On such occasions his endurance was generally rewarded by some exciting adventure, or by the acquisition of some rare specimen of which he had long been in search.

Although he never succeeded in catching a Weasel asleep, he was once caught asleep by a Weasel! It happened thus:—Exhausted with fatigue he had flung himself down by a dyke-side and fallen asleep, having previously placed in his hat for safety some young birds which he had found during his ramble. He had not slept long when he was suddenly awakened by something cold pressing in between his forehead and his hat. It was a Weasel, who had scented the birds and was trying to get at them. Edward threw him away to some distance amongst the grass, and went to sleep again: but the Weasel found his way back, and again attempted to displace his hat. Three times was the pertinacious little animal repulsed and flung to a distance, and three times did he return to the attack; until the would-be sleeper was at length compelled to strangle him to secure a night's rest. He had a very similar adventure with two Rats, and on another occasion he had a most desperate encounter with a Polecat which he had seized with his bare hands, and after a severe struggle, in which he was terribly bitten and scratched, he succeeded in forcing down its throat some chloroform which he always carried with him for the purpose of killing insects, and eventually despatched it. Fancy administering a dose of chloroform, single-handed and bare-handed, to a Polecat! Verily these Scotch naturalists have no lack of courage.

He had an odd adventure one night with an Owl. He had fallen asleep in a fox's "earth," with his head upon the lock of his gun: before entering the burrow he had caught a Field Mouse, which he wished to take home alive, and he thought the best way to do this was to tie a string, about six feet long, round its tail, and attach the other end to his waistcoat; the little fellow had thus full liberty to the end of his tether. While Edward was sleeping soundly, he was awakened by something tugging at his waistcoat, and by hearing some terrific screeches close to his head. Starting to a sense of recollection, he remembered the Mouse, and pulled back the string to which it had been attached. The Mouse was gone: nothing but the skin of his tail remained. He looked up and saw an Owl sitting on a tree a few yards off. The situation was explained.

Being resident, as we have said, at Banff, his rambles extended coastwise along the shore of the Moray Firth for about seven

miles in one direction and about six in another. These excursions also extended inland for about five or six miles. He had thus three distinct circuits (many views from which have been beautifully drawn by Mr. Reed as illustrations to the present volume), and although he only proceeded on one at a time, he generally managed to visit each district twice a week.

The use which he made of his time may be judged from the result of these excursions. His accumulation of natural objects became something extraordinary : in eight years he had preserved nearly 2000 specimens of living creatures collected in the neighbourhood of Banff—quadrupeds, birds, reptiles, fishes, crustacea, corals, sponges, and other objects—to say nothing of a large collection of carefully-dried plants, the whole of which he learnt to mount or preserve himself. It is melancholy to think how this fine collection was afterwards sacrificed ! Yet so it was. Quitting his native place, as many a man has done, “to better himself,” Edward left Banff for Aberdeen, taking with him the whole of his treasures, and made a painful effort to gain a livelihood by opening his museum to the public at a small charge for admission. But “the people of Aberdeen were not yet prepared for such an exhibition, especially as it had been the work of a poor man. He was candidly told that he had come several centuries too soon !” Very few visitors came, and those who did come knew very little about Natural History. The receipts, never large, became less and less, until, to save his family from starvation and to pay off debts unavoidably and most unwillingly incurred, the whole collection was one day sold for the pitiful sum of £20 10s. ! It was purchased by a Mr. Grant for a son who had a taste for Natural History, and the specimens were all removed to his house at Ferryhill. They were afterwards removed to St. Nicholas Street, where they were stored up in some damp and unsuitable room, and, being otherwise neglected, it is believed that the whole collection eventually went to ruin.

It must have been a bitter pang to part with it—the cherished result of years of toil and trouble ; but stern necessity stared him in the face, and Edward was glad to receive even the paltry sum he did to free him from the terrible anxiety of living without an income. He quitted Aberdeen and returned to Banff to work at his old trade, and felt happier to be amongst his old friends than with the unsympathetic folks he had left behind him.

Fortunately for others, although the collection had gone, the knowledge gained in forming it had been well stored, and, through the kindness of his friend the Rev. Mr. Smith, of Monquhitter, Edward, whose keen powers of observation gave eloquence to his descriptions, was enabled to impart much valuable information to many of his brother naturalists.

Those who would know something of what he has accomplished in only one department of Zoology, should consult Bates' and Westwood's 'History of British Sessile-eyed Crustacea,' wherein his services are fully acknowledged. Of the numerous Crustacea mentioned in that work, Edward collected *one hundred and twenty-seven* in the Moray Firth, *of which twenty were new species!* Many of his beetles and other insects he sent for identification to our late friend Edward Newman, who named them for him, and assisted him liberally with books on Natural History that were likely to be useful to him. Their correspondence originated in his articles on the "Birds of Banffshire," which began to appear in 'The Zoologist' in August, 1856, although this was not his first contribution to this journal. Mr. Newman asked for some information about fishes, which Edward promised to supply: the result was that many new fishes were found in the Moray Firth, simply from his determination to search for, collect, and preserve them.

When Mr. A. G. More was collecting material for his excellent papers on the distribution of birds in Great Britain during the nesting season, published in 'The Ibis' for 1865, Edward was asked by him to act as observer for Banffshire and the northern part of Aberdeen, in which capacity he communicated much useful information, which Mr. More fully acknowledged.

But his most important correspondence has been with Mr. Couch on British fishes, and with Mr. Spence Bate and the Rev. A. M. Norman on Crustacea. To these subjects two chapters (XV. and XVI.) have been wisely devoted in the volume before us, and Mr. Smiles has rendered a service to zoologists by bringing together in this way much valuable information which was previously scattered throughout various books and periodicals. These chapters are very instructive, and should be read *in extenso*.

Like many others, not alone naturalists, Edward has had his share of loss and disappointment. What more vexing than to lose a beautiful series of *Lepidoptera* through the depredations of mice, and to have a valuable collection of dried plants, which had

taken years to prepare and name, entirely destroyed through the ill-mannered behaviour of a couple of cats?

There was one Crustacean about which some difficulty had arisen. It was *Mysis spinifera*, which Edward had first found in the Moray Firth in 1858. He had sent it to one of his correspondents to be named, but it remained unnoticed and unknown for at least four years, when it was re-discovered in Sweden by M. Goes, who at once published the fact. "Thus," says Edward, "the first finder, as well as the country in which this Crustacean was first found, have both been ignored in the records of Science."

But the day of disappointment, we trust, has passed: after years of unceasing labour in the pursuit of knowledge, and withal of patient struggling with adversity, perseverance has had its reward. Fortune at length has smiled upon our naturalist (in a twofold sense), and few will read the 'Life of a Scotch Naturalist' without echoing the words of the Queen, who, "touched by his successful pursuit of Natural Science under all the cares and troubles of daily toil," has graciously conferred on him a well-merited reward.

If we have abstained from criticising Mr. Smiles' share in this book, it is because we think that the sense of gratification which he must feel in having been the means of obtaining a pension for a most industrious and deserving man will be a far greater recompense to him than any praise bestowed by unknown critics.

Whether it is desirable to write a man's biography in his lifetime is a question upon which there may be two opinions. Mr. Smiles has anticipated the objection in his preface, where he pleads justification on the ground that his hero's life is well-nigh ended, and that his work is done. A further argument in his favour may now be found in the fact that had the 'Life' not been written, the Scotch naturalist would not have received his pension. Let us hope that he may yet live long to enjoy it.

Our Birds of Prey; or, the Eagles, Hawks, and Owls of Canada.

By HENRY G. VENNOR, F.G.S. With thirty Photographic Illustrations by W. Notman. 4to. Dawson Brothers, Montreal; Sampson Low & Co., London. 1876.

MR. VENNOR, in his "Introduction," tells us that he has been engaged on the present work for thirteen years; and he writes:—

"From the year 1865 to the present, in connection with explorations undertaken on behalf of the Geological Survey of Canada, I have had unusual facilities for field observation, and have traversed the greater part of that portion of Ontario which may be described as lying between the Ottawa river and its sources, and the St. Lawrence and its great lakes, a region the interior of which is but thinly settled, and comparatively unknown; also a large part of the country lying to the northward of the Ottawa river, between the Lake of Two Mountains and Pembroke." The author further informs us that he considers that the Ornithology of Canada has received a very fair share of attention from naturalists both at home and abroad. In this opinion, however, we cannot concur, for at present Canada compares in this respect very unfavourably with the United States. We therefore welcome with pleasure this first instalment of a work on the birds of that country, for we trust that Mr. Vennor will receive such an amount of appreciation as will induce him to continue his publications on this interesting subject. He is properly impressed with the difficulties which always attend the production of an ornithological work in these days of multiplied synonymy and many books, which he does well not to force upon his readers, and he is not content with the mere descriptions of the birds, but he also brings forward the characteristic details of the whole order *Raptores*, so that this work would give any student a good general idea of the birds of prey. This is to our mind one of the great recommendations of the volume; but Mr. Vennor has not thoroughly succeeded in impressing us with the advantages of photographic illustrations for an ornithological work. As specimens of photography the plates executed by Mr. Notman are admirable, but the stuffed specimens which are photographed are very unequal in merit. For those, however, who are inclined to adopt this mode of illustration, we will quote, in justice to himself, the author's words, "On the Attitude and Form of the Birds figured":—

"These are points requiring a great deal of attention in the photographing of stuffed specimens, and respecting which I have already been brought to task by a few of my naturalist friends, to whom some of the plates were shown. My experience, however, among naturalists has been that no two agree as touching any position which may be chosen for a bird; and consequently no plates, no matter how perfectly executed, could please all. Besides I have invariably found that those who find most fault in

this respect are persons who have been little on the *field* themselves, or, in other words, who rather belong to the class known as *closet* than *field* naturalists; the latter knowing well that it is really almost impossible to conceive of a position which is not sometimes assumed by the living bird. Of this point I have recently been more convinced than ever from the study of two living specimens of Owls—the Snowy Owl and the Short-eared Owl—which have been in my possession for some months. For instance, taking one out of the many positions indulged in by the first of these birds, what would my criticising friends have thought and said had I represented him as a round ball of white feathers, head hardly perceptible, feet entirely concealed, and squatting on the ground like a hen covering her chickens? Yet this is the position in which I always find my Snowy Owl when I unexpectedly enter her abode. When aroused, however, she draws herself up, her head and feet become visible, and she presents such a figure as one of those given on the two plates allotted to this species in this work. The Short-eared Owl has many remarkable attitudes, and most of these differing from any of those in which the bird is figured in ornithological works. His wings are seldom kept close to his body, but rather in a drooping position, and either resting on the perch on which he sits, or, as the case may be, trailing on the ground: while his head is generally sunk deeply between his shoulders. In fine, the attitude of a bird is anything conceivable. The form of the bird is of far greater importance than its attitude, and in the specimens selected for this work this was carefully perpetuated by means of girths and numerous measurements made from the bird *while in the flesh*, and generally immediately after death.

“Of still greater importance, however, than either of the foregoing points is the careful selection, already referred to, of proper or typical forms of plumage, of young, old, male and female birds. Compared with this, the attitude is of but trifling consideration, and it would have served the purpose of this work equally well had I simply selected and photographed appropriate unmounted skins. Indeed, had it been necessary in order to show properly some specific detail connected with the feet and claws, I should not have hesitated to have mounted the bird accommodatingly holding forth his foot for the inspection of the enquiring student; so when the exhibition of the under sides of the wing was desirable I have not hesitated to give the bird the necessary position. In fine, the main object of this work is practical utility—not a mere exhibition of pretty photographs.”

On this point, the author, in the foregoing paragraph, has almost disarmed criticism, and, after reading what he says, we are inclined to agree with many of his arguments; for the purposes which he has in view, we must certainly say that the photographs, of which there are no less than thirty, give in most

instances a much better idea of the species than badly executed plates would do under similar circumstances. The nomenclature of the Canadian birds of prey adopted by Mr. Vennor is principally that employed by Mr. Ridgway in the great work on 'North-American Birds'; but in certain instances we cannot agree with him, as, for example, when he classes the Greenland Falcon (*Falco candicans*) and the Labrador Falcon (*Falco Labradorus*) under the head of one species, which he calls *Falco sacer* of Forster. The information given under Swainson's Buzzard will be largely supplemented by future observations; for although Mr. Vennor appears to have been under the impression that the species was hardly distinct, there is really not the smallest doubt as to its being a very well-marked species, and representing in the northern part of the New World the well-known Common Buzzard of Europe. Again, Mr. Vennor follows Mr. Ridgway in treating the South-American Harrier (*Circus cinereus*) as a mere "variety" of *C. Hudsonius*; but we must remark, *en passant*, that if such well-marked birds are not to be considered as true and distinct species then all the other Harriers of the world may as well be united under one heading. He duly notes the rarity of blue-plumaged Harriers as compared with the brown-plumaged individuals, and it is possibly the rarity of the former that has prevented him from giving more than a figure of a female or young bird.

In conclusion, we may remark that no one can study this book without finding that it adds greatly to our knowledge of Canadian Ornithology, and we observe with pleasure the very careful notes on the habits and distribution of the species. In every instance, also, the soft parts of the birds are given—a feature omitted in the work on 'North-American Birds' above alluded to.

The Fox at Home, and other Tales. By GEORGE ROOPER, Author of 'Flood, Field, and Forest,' 'A Month in Mayo,' &c. With eight illustrations by G. Bowers and J. Carlisle. Second Edition. Post 8vo, pp. 248. London: Hardwicke & Bogue. 1877.

THIS little volume, as may be gathered from its title, is written perhaps rather for lovers of sport than for lovers of Natural History, but to both the book will be welcome. Every page bears upon it

the impress of an observant study, both of man and animals, a power of imparting the fruits of such study to others, and a thorough appreciation of all those little lights and shades in Nature, apparently unimportant in themselves, but which unite to give force and beauty to the picture of life.

Our author takes us through many sports and some variety of country, beginning with one which we agree with him in thinking one of the most delightful—Fox-hunting. As we read, memories of the past come thick upon us. Again we see the wary old fox as he steals from the covert, the hounds quivering with excitement as they sweep on to the scent, and every nerve is braced as we follow our author o'er plough and pasture, clearing again, in fancy, the hurrying river, and crashing through the tangles of the bull-finches, too high to top. It is in scenes such as these that Mr. Rooper, like his fox, is most thoroughly “at home”; but his enthusiasm is not confined to the saddle. In a short sketch he gives us a week in the Western Highlands, and though our company there consists only of a holiday-making *employé* from a London warehouse, who, having purchased a ten-shilling gun-license, fancies himself every inch a sportsman, still we enjoy the week almost as much as the cockney hero. The description of the Scotch laird and his gillie is capital, their Gaelic unimpeachable, and over the whole is blown a scent of the “muirs” that is really refreshing.

From Scotland we travel to the Sister Isle for salmon and trout-fishing, returning rifle in hand to bring down the buck in our own southern counties, where we again fall in with our cockney friend disporting himself with the “Harriers” at Brighton and the “Queen’s” in the Harrow Country.

Most, if not all, of these stories were published many years ago under the title of ‘Tales and Sketches,’ but they come before us now with some additions, not the least noticeable of which are eight full-page illustrations, somewhat rough perhaps, but withal full of spirit. Indeed, the artists’ names (Georgina Bowers and J. Carlisle) sufficiently guarantee their excellence.

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ON THE GEOGRAPHICAL DISTRIBUTION OF THE FALLOW DEER PAST AND PRESENT.

TRANSLATED FROM THE GERMAN OF L. H. JEITTELES.*

By P. D. ULLMANN AND J. E. HARTING.

NATURAL HISTORY shares with History the doubtful honour of possessing many chapters which are nothing more than what Talleyrand would call "des fables convenues," or which are made up of fallacies universally adopted as true. To this unfavourable side of science Geology contributes the largest share, but Zoology is by no means exempt, especially as regards the habits, haunts and geographical distribution of animals.

According to most works on Zoology, "The Fallow Deer (*Cervus dama*) is a native of the countries washed by the Mediterranean, from whence it was introduced into Germany, Scandinavia, and England after the Crusades." And yet this animal was equally indigenous many thousand years ago, not only in Africa and Western Asia, but also in Southern Russia, and even in Central Europe, Denmark, Italy, and the South of France.

My researches into the geographical distribution of the Fallow

* 'Ueber die geographische Verbreitung des Damhirsches in der Vorzeit und Gegenwart.' Von L. H. Jeitteles, 'Der Zoologische Garten,' 1874, pp. 288—297. After this article had been translated and forwarded to the printers, we discovered that an English translation by Mr. P. L. Sclater had already appeared in 'Nature' (26th November, 1874). To many readers of 'The Zoologist,' however, we believe the subject matter will be new, and therefore we do not hesitate to offer the present version. At the same time we cannot do better than quote, by way of supplement, the valuable criticisms which this essay has elicited from Prof. Boyd Dawkins ('Nature,' 10th December, 1874) and Sir Victor Brooke ('Nature,' 14th Jan. 1875).

Deer, as well as my study of the history of the domestic fowl,* were occasioned by an antiquarian discovery at Olmütz. There, in the same stratum with the skull of the domestic fowl, and amongst weapons and utensils of the early Bronze Age, was found a piece of horn, which from its flatness and from the total absence of rugosities and tubercles (*runzeln und perlen*), I was at once inclined to consider a fractured portion of the horn of a Fallow Deer. Careful comparison with the horn of the Red Deer, Reindeer, Elk, and Irish Elk, in different museums, particularly those of Stuttgardt and Munich, and in numerous private collections, confirmed my opinion. Reliable authorities on the *Cervidæ* agreed with me, although a still greater authority, Professor Rütimeyer of Basle, suggested the possibility of this fragment from Olmütz having belonged to a Red Deer.

Cuvier mentions fossil horns of the Fallow Deer, and speaks of "bois assez semblables à ceux du Daim, mais d'une très grande taille, trouvés dans la vallée de la Somme et en Allemagne."† He has also figured two pieces of horn from Abbeville, which are certainly taken from the true Fallow Deer. Moreover, he has given a copy of a drawing sent to him by Autenrieth:—"D'un crâne et d'un merrain y adhèrent, déposés au cabinet de Stuttgardt; pièces que ce savant rapportait au cerf à bois gigantesques, mais qui me paraissent plutôt se devoir rapporter à ce Daim à cause de la longueur de la partie cylindrique."‡ Subsequently similar remains of horn were dug up in Gergovia, near Clermont, in the Department of Puy-de-Dôme, and at Polignac, near Puy, in the Department of Haute-Loire, which were described by F. Robert as those of *Cervus dama polignacus*; by Pomel as *C. somonensis* and *C. Roberti*; and by Gervais as *C. somonensis*, with an original figure by Desmarest. Gervais describes them as "des bois de Daims qui indiquent une espèce ou variété bien plus grande que celle dont il a été question ci-dessus" (namely, *C. dama*); and that these horns were "d'un tiers à moins plus grande que ceux du Daim ordinaire."§

Georg Jäger, in his "Review of the Fossil Mammalia of Wurtemburg,"|| refers to numerous discoveries of the remains of Fallow

* See 'Zool. Garten,' vol. xiv., p. 55.

+ 'Recherches sur les Ossemens Fossiles,' vol. vi., Article iii., p. 191 (ed. 1836).

† Id., pl. 168, fig. 11.

§ Zool. Paléon. Franç., 2 ed., Paris, 1859, p. 145.

|| 'Nova Acta Acad. Cæs. Leop. Carol.,' vol. xxii., pars post. 1850, pp. 807, 893, 897.

Deer in the caves and bogs, as well as in the diluvial fresh-water chalk of Wurtemburg. He further states that in the Museum of Mannheim there are skulls not only of *Bos primigenius*, but also of *B. priscus* and its ally *B. priscus affinis*, with a skull of *Cervus dama giganteus*, all found in the diluvium in the neighbourhood of Mannheim.

In the Museum at Linz, in Upper Austria, numerous remains of animals from the diluvium in the neighbourhood of Wels are preserved, which were discovered at no great distance in cutting the railway known as the Elizabeth-Westbahn in Buchberg. Besides a fractured piece of the horn of a Red Deer, a molar of *Ursus arctos* (not *U. spelæus*), a fine molar of the Mammoth (*Elephas primigenius*) and horses' teeth, there is in the Museum—amongst those remains marked as found in the above-mentioned railway cutting—a fine large fragment of horn undoubtedly belonging to a Fallow Deer. Like the fragment of horn of *Cervus elaphus* from the same locality, it is of a white colour and has a calcined appearance. In 1870 and again in 1873 I examined this interesting fragment of horn, with the other animal remains found at the same time, and am indebted to the kindness of Herr Kaiserl Ehrlich, the Curator of the Museum, for a photograph of it. In October, 1873, I also inspected the cutting at Buchberg, and convinced myself of the purely diluvial nature of the soil there. In many places I found it deeply excavated for gravel (*schotter*), and it seems clear that the horns and teeth preserved in the Museum at Linz were found in one of these gravel-pits, but lying in a stratum of marl (*mergeligen*) beneath the gravel.

Fragments of horn undoubtedly belonging to the Fallow Deer were dug out by Dr. F. A. Wagner in the autumn of 1828, in the ash-heap (*aschenschicht*) of a so-called place of sacrifice (*opferherdes*) between Schlieben and the village of Malitzschkendorf, in Schweinitz, Saxony, in large quantities, together with remains of the Elk (among them a four-tined elk-horn), the teeth of mighty boars, and remains of very large oxen, roe-deer, and sheep, as well as wheat and millet. A detailed account of these discoveries is given in his work.* Dr. Wagner (a physician at Schlieben) prosecuted his researches with the greatest conscientiousness and determined the animal remains in question with great care and

* 'Ægypten in Deutschland oder die germanisch-slavischen wo nicht rein germanischen Alterthümer an der schwarzen Elster.' Leipzig, Hartmann, 1833.

skill, as will be evident from his work, the bombastic title of which may be overlooked. In the determination of the various fragments of horns he was assisted by a well-known and excellent zoologist, Professor Nitzsch, of Halle. The four-tined elk-horn is figured (pl. v., fig. 8), but unfortunately not the pieces of Fallow Deer's horns. Besides the remains of animals and plants, these places of sacrifice yielded various fashioned bones, three needles, fragments of battle-axes, pieces of urns, four entire vessels, and a polished shin-bone of an ox. Dr. Wagner also recognised therein a skate and other bones beautifully polished. No human bones were found. As regards the Fallow Deer, Dr. Wagner writes as follows (p. 34):—"In digging at various times in this temple, we found fragments of horns which were more than suggestive of those of the Fallow Deer; but as no complete skeleton was ever secured, nor even such portions as would place the matter beyond doubt, it is still uncertain whether this species was sacrificed along with the Elk (*Cervus alces*), and the subject requires further investigation."

Alex. von Nordmann, in his 'Palæontologie Südrusslands,'* gives a drawing of five teeth from a "*Cervus fossilis damae affinis*." But in the diluvial period, and in later prehistoric times the Fallow Deer existed in more northern latitudes. In the year 1871, in the centre of the town of Hamburg, and subsequently in a tributary of the Elbe, numerous upper and lower jaws were discovered, larger than those of the existing *Cervus dama*, except as regards the teeth, which corresponded in size with those of the existing species. With these were found remains of the Aurochs, and other large oxen, and bones of the horse, pig, and other animals. The remains first discovered were found between tree-stumps in twenty to twenty-two feet of "solid black peat, the alluvium of the Alster, below the diluvial *Geestrücken* of Neustadt."†

Prof. Steenstrup has given a short account of the collection of animal remains from the Kjökkenmöddings and peat bogs of Denmark, which were exhibited on the occasion of the Archæological Congress in 1869 in Copenhagen, amongst which he mentions (pp. 160 *et seq.*) the Fallow Deer, whose horns and bones were

* Helsingfors, 1858-60, plate xviii., figs. 4—8.

+ Dr. Zimmermann, on a new species of deer from the alluvium of Hamburg, 'Neuen Jahrbuch für Mineralogie, Geologie und Palæontologie,' Heidelberg, 1872, 1 Heft, p. 26.

found in the upper peat of Denmark:—"Le Daim (*Cervus dama*). Bois et ossements provenants des états supérieurs de la tourbe."* Nevertheless he adds, "Cet animal n'est pas originaire du Danemark; il est bien constaté qu'il a été introduit dans le pays pendant le moyen âge."

In Owen's 'History of British Fossil Mammals and Birds' (1846, pp. 483, 484) are some brief remarks on the discovery of fossil remains of the Fallow Deer in a few localities in England, but the specimens referred to are described as "far from yielding satisfactory grounds of identification." From the peat-moss of Newbury portions of palmated antlers and teeth have been dug out, which accord in size with those of the Fallow Deer, and Dr. Buckland found similar remains in the large cave of Paviland, on the coast of Glamorganshire, with the remains of the Mammoth, Rhinoceros, *Hyæna*, &c., "deer of two or three species, and fragments of various horns, some small, others a little palmated." Professor Owen justly remarks that "the same doubt as to whether the latter are referable to the Reindeer or the Fallow Deer arises as in the case of the palmated fragments from Newbury."

Among the animal remains found in the Swiss Lake dwellings were discovered fragments of horn that apparently belonged to the Fallow Deer. Referring to this, Prof. Rütimeyer says:†— "A number of flat pieces of palmated horn with perfectly smooth surface found in the Bieler Lake, and now in the collection of Lieutenant Schwab, of Biel, can only belong to the Fallow Deer, judging from their size and form. I could only ascribe to this animal similar pieces from Meilen, which fully agreed with the abnormal form which the horn of the Fallow Deer assumes in old age (Cuv., Ossem. Fossiles, iv., tab. iii., figs. 32—35). At the same time I must remark that I have never yet seen a perfect antler from the pile-dwellings (*Pfahlbauten*), nor even fragments of the skull, which, next to the horn, would offer the most important characteristics of the Fallow Deer. Reliable evidence of the spontaneous existence of this species of deer north of the Alps is therefore still desirable." Nevertheless the existence of this animal in the *Terremare* of Italy—which is equivalent to the Swiss *Pfahlbauten*—is quite certain. In the Museum of Modena are two fragments of horn, respecting which

* 'Bulletins du Congrès International d'Archéologie préhistorique à Copenhagen en 1860.' Copenhagen, 1872, p. 162.

+ 'Fauna der Pfahlbauten der Schweiz,' p. 62.

Professor Canestrini,* and more recently Mortillet,† have given some account. In 1870, at my request, Dr. Carlo Boni, subsequently Director of the Museum of Modena, had the goodness to send to me at Basle—where I was spending the winter of 1869-70—these two fragments for comparison with mine from Olmütz, when Professor Rütimeyer, who also saw them, determined that one of them (marked “624 Gorzano”) must have belonged to *Cervus dama*.

As well as in Moravia, the Fallow Deer seems, in olden times, to have existed on the borders of Lower Austria. In Pulkau, not far from Eggenburg, south of the Thaya, in an ancient place of sacrifice, discovered and described by Dr. Woldrich, were found earthen vessels, implements of stone, bone and horn, a bronze casting-mould, the remains of the dog, ox, and red deer, and a piece of horn that was conjectured to be “the tine of a Fallow Deer’s antler.”‡

That the Fallow Deer inhabited the woods of Switzerland in the middle ages may be gathered from the following words in the Benediction of the monk Ekkehard, of St. Galle, who lived in the eleventh century:—“*Imbellem damam faciat benedictio summa* ;”§ and even at a later date, according to a statement in Forer’s German edition of Gesner’s ‘Natural History’ (Heidelberg, 1606, p. 84), where it is said that “The Fallow Deer is hunted in many other places, and is frequently captured in the woods of Switzerland and near Lucerne: it is called Dam, Dämlin, or Damhirsch.” In the Latin edition, however (Hist. An., vol. i., 2nd ed., Frankfort, 1620), which is now before me, I can find no important observations on the appearance of the Fallow Deer in Switzerland. The author merely states (p. 308), “*Nostra vero dama etiam in Europa capitur cum alibi tum circa Oceanum Germanicum, ut audio. Germani vulgo vocant Dam, vel Dämlin, vel Dannhirtz, vel Damhirtz potius; Itali, Daino, nonnulli Danio; Galli, Dain vel Daim; Hispani, Gamo vel Corza.*” Moreover, in

* ‘Oggetti trovati nelle terremare del Modenese, Seconda Relazione: Avanzi Organici,’ Modena, 1866.

+ ‘Mériaux pour l’Histoire Positive et Philosophique de l’Homme,’ 3me année, 1867.

‡ Woldrich, ‘Mittheilungen der anthropologischen gesellschaft in Wien,’ vol. iii., 1873, pp. 13 and 19, and plate iv., fig. 54.

§ ‘Bened. ad mensas Ekkehardi,’ Vers. 128. *Vide* ‘Mittheil. der Antiquar. Gesellschaft zu Zurich,’ iii., p. 111.

both the Latin and German editions of Gesner the Fallow Deer is unmistakably portrayed.

According to the marginal notes on Daniel Spekle's excellent map of Alsace there were still Fallow Deer in Wasgau as late as 1576.* In the neighbourhood of Rome, in a postpliocene travertine on the heights of Monte delle Gioie, numerous fragments of antlers of the Fallow Deer have been found with remains of *Hyæna spelæa*, *Cervus tarandus*, *Rhinoceros megarhinus*,† &c.

Finally, it may be observed that representations of the Fallow Deer are found carved on Assyrian monuments, and with such characteristic accuracy that it is impossible to confuse them with those of any other species. We would recommend the reader to examine the beautiful plates, Nos. 35 and 53, in Layard's 'Monuments of Nineveh.' Representations of this species are also to be seen in the pictures on the walls of Egyptian tombs, as for example at Beni-Hassan. The hieroglyphical name is "hanen."‡

We will now consider the present geographical distribution of *Cervus dama*.

This species is still found in a wild state in Asia Minor. Canon Tristram speaks of its occurrence near Mount Tabor, in Palestine, and in the woods between this mountain and the gorge of the Litany River, and he once met with it himself "about ten miles west of the Sea of Galilee."§ The late Prof. Ed. Lartet had previously found teeth of this species of deer in the bone-heaps of Lebanon.|| According to Hartmann, "The Fallow Deer inhabits the fertile valleys of the deserts of Africa and the borders of the cultivated parts of Tunis, Tripoli, Barqah, as far as Wâdî-Nâhûn."¶ Gervais, in his 'Zoologie et Paléontologie Française' (2nd edit., p. 145), records its presence in the neighbourhood of La Calle, in Algiers, but Loche, in his 'Hist. Nat. des Mammifères de l'Algérie' (Paris, Bertrand, 1867), says it is now seldom met with in that province. In the island of Sardinia, in Cetti's time, there were large numbers of Fallow Deer on every part of the island, and especially

* Gérard, 'Faune historique de l'Alsace,' Colmar, 1871, p. 328.

+ Trutat et Cartailhac, Matériaux pour l'Histoire de l'Homme,' 1869, p. 299.

† Robt. Hartmann, in Brugsch 'Zeitschrift für Ägyptische Sprache und Alterthumskunde,' Jahrgang ii., 1864, p. 21.

§ 'Report on the Mammals of Palestine,' Proc. Zool. Soc. Lond., 1866, p. 66.

|| 'Bulletin de la Société Géologique de France,' xxii., p. 542.

¶ 'The Geographical Distribution of existing wild Mammalia of North-East Africa,' in the 'Berliner Zeitschrift für Erdkunde,' 1868, p. 252.

on the plains of Sindia.* At that time no fewer than 3000 head were annually killed in Sardinia. It is remarkable that the inhabitants call it "Crabolu," a corruption of *Capriolo* (the Roebuck), which does not exist on the island, while the Red Deer is occasionally met with, more particularly in the east, although it does not attain so large a size here as on the Continent.† According to Bonaparte and Cornalia,‡ this species of deer is still tolerably common on this island. In Spain it appears there are very few wild deer now-a-days: at all events, A. E. Brehm, in his 'Beitrag zur Zoologischen Geographie Spaniens,' could only recollect having seen them in parks.§ On the other hand, Graëlls refers to *Cervus dama* as an inhabitant of the Sierra Guadarrama.|| The modern Spaniards call this animal "Gamo" or "Paleto." Buffon ¶ says that in his time the Fallow Deer of Spain had longer tails than elsewhere, and were nearly as large as the Red Deer. Gérard, in his 'Faune Historique de l'Alsace,' already quoted (p. 327), informs us that this species of deer still occurs in a wild state in France,—for instance, in Nivernais, in the Cevennes, and in the Alps of Dauphiné,—but does not say on what authority he makes this statement, and Gervais, in his 'Zoologie et Paléontologie,' does not mention it. As regards Greece, Blasius, in his 'Mammalia of Germany' (Brunswick, 1857, p. 455), says, "Belon found the Fallow Deer on the islands of the Grecian Archipelago"; but Erhard does not mention it in his 'Fauna der Cycladen' (Leipzig, 1858). V. d. Mühle, however, refers to it in his 'Beiträgen zur Ornithologie Griechenlands' (1844, p. 1).**

From the foregoing data the following conclusions may be drawn:—

1. In prehistoric times the Fallow Deer, with other extinct Mammalia, inhabited Lebanon, South Russia, Italy, France, Upper Austria, Wurtemburg, Baden, Saxony, Hamburg, and Denmark.

* 'I Quadrupedi di Sardegna,' Sassari, 1774, pp. 104, 105.

+ [Both Lord Lilford and Mr. Basil Brooke have observed the Fallow Deer wild in many parts of Sardinia.]

† 'Fauna d'Italia,' parte prima (Milano).

§ 'Berliner Zeitschrift für Erdkunde,' 1858, p. 101.

|| [Lord Lilford has seen it wild in Central Spain, near Aranjuez.]

¶ 'Histoire Naturelle,' tome vi., Paris, 1756, p. 170.

** [Lord Lilford has observed wild Fallow Deer in the province of Aearnani, in Greece; and in December, 1864, as we are informed by Mr. Selater, the Zoological Society received a small dark-coloured Fallow Deer from the island of Rhodes.]

It seems also to have occurred in Switzerland and in England, as well as in Moravia and Lower Austria.

2. Within historic times it inhabited Egypt (tombs of Beni-Hassan) and Assyria; and, in the latter part of the middle ages, Switzerland and Alsace.

3. It is still found in a wild state in Asia Minor, North Africa, Sardinia, and apparently in parts of Spain and Greece, and perhaps still in the Cevennes and the Alps of Dauphiné.

4. The size and strength of the antlers, as well as the size of the skull, have in course of time degenerated. The skull and antlers of existing Fallow Deer are smaller than those of prehistoric times.

—o—

ON THE NORTHERN RANGE OF THE FALLOW DEER IN EUROPE.

BY W. BOYD DAWKINS, M.A., F.R.S.*

IN the interesting essay by Dr. Jeitteles many cases of the reputed discovery of the remains of the Fallow Deer are collected together to prove that the animal is indigenous in Northern Europe, and not imported from the south, as heretofore has been supposed by many able naturalists, such as Blasius, Steenstrup, Rütimeyer, the late Prof. Ed. Lartet, and others. These cases are accepted by Dr. Sclater without criticism, and are deemed by him to place the importation theory, as it may be termed, in the category of "ancient fables." The question, however, seems to me, after many years' study of the fossil and recent *Cervidae* of this country and of France, a very difficult one, not to be decided off-hand, and certainly not without a strict analysis of the value of evidence such as that recorded by Dr. Jeitteles, whose method and facts appear to be equally in error.

The identification of fragments of antlers is one of the most difficult tasks which a naturalist can take in hand, and where there are several species of deer associated together in the same deposit, it is sometimes impossible to assign a given fragment to its rightful owner. For example, in the forest beds of Norfolk and Suffolk, and in the Pleiocenes of the Continent, there is a vast number of antlers which are ownerless, and which have completely baffled

* Reprinted from 'Nature,' December 10th, 1874.

Prof. Gaudry, myself, and others for many years. It is, of course, easy for anyone to classify the flat antler as belonging to one species and the round to another; but the value of the determination depends upon the number of species living at the same time in the same place, possessed respectively of round and flattened antlers. In the pleistocene and prehistoric ages, there were four animals which had portions of their antlers flattened—the Reindeer, Irish Elk, true Elk, and Stag—to which, according to Dr. Jeitteles, must be added the Fallow Deer. In this particular case it is not only assumed that the flat-antler fragments belong to the last of these animals, but even the uncertain testimony of various authors, who had not critically examined the remains, which they record, in relation to the other species, is taken to prove the range of the Fallow Deer as far north as Denmark. The mere printed reference to the Fallow Deer is accepted as evidence, without, save in two cases, being verified by personal examination. The results of such a method of inquiry seem to me to demand most careful criticism.

The alleged cases of the discovery of Fallow Deer in Central and Northern Europe are as follows:—In Switzerland, it is stated to have been identified by Dr. Rütimeyer among the animals which had been used for food by the dwellers in the Lake villages; “although,” he writes, “incontrovertible evidence of the spontaneous existence of this deer north of the Alps remains still to be obtained.” In a list of the Swiss Mammalia which Dr. Rütimeyer was kind enough to prepare for me in 1873, the animal is altogether omitted from the pleistocene and prehistoric fauna. Thus, in the opinion of this high authority, it was not living in Switzerland in those early days. The animal is stated also (on the authority of Jäger in 1850) to have been found abundantly in “the caverns and turbaries as well as in the diluvial freshwater chalk of Wurtemburg.” To this I would oppose the opinion of my friend Prof. Oscar Fraas, of Stuttgart, from whose list of animals (sent to me in 1872) the Fallow Deer is conspicuous by its absence. The Reindeer is abundant in the caves of that region, and to it the flattened fragments of antlers may probably be referred.

To pass over the reputed discovery of the animal “in an old place of sacrifice” near Schlieben, in 1828, in which the discoverer himself remarks that “the subject requires further investigation,” there only remain three other sets of fragments to be examined in Germany. First, those at Olmütz, which Dr. Rütimeyer considered

to belong possibly to the Stag; secondly, an indistinct figure in the 'Ossemens Fossiles' of an antler attached to a skull found at Stuttgart, which seems to me to belong to the Reindeer; and, lastly, a fragment of antler from Buchberg, which, taken along with the find at Olmütz, is the second of the two cases identified by Dr. Jeitteles. It is a museum specimen, which may very probably be liable to the same doubts as those which are entertained by Dr. Rütimeyer regarding the fragments from Olmütz. The teeth and bones from Hamburg are as likely to belong to the Stag as to the Fallow Deer.

The alleged instances of the discovery of the animal in this country and in France are equally unsatisfactory. The flattened antlers alluded to by Buckland and Owen belong either to the Stag or the Reindeer. Among the many thousands of bones and teeth which I have examined from the ossiferous caves of various ages, from refuse-heaps and tumuli, I have never seen any fragment which could be attributed to Fallow Deer, except in refuse-heaps not older than the Roman occupation. Nor is it found in Ireland till the middle ages. The late lamented Prof. Ed. Lartet, whom I always consulted on difficult questions such as these, believed that the animal was not living in Central and Northern France in the pleistocene or prehistoric ages, but that it was imported probably by the Romans.

The only evidence against this view is that afforded by an antler dug up in Paris and brought to Prof. Gervais along with stone celts by some workmen. It seemed to me when I saw it in 1873, in the Jardin des Plantes, not altogether conclusive, because of the absence of proof that all the remains were obtained from the same undisturbed stratum. I should expect to find such antlers in the refuse-heaps of Roman Paris, as in Roman London, and I should not be at all surprised if the remains of widely different ages were mingled together by the workmen, even if they were found in the same excavation. As examples of the necessity of guarding against this source of error, I may quote a recent lower jaw of Kangaroo Rat in the collection of my late friend Mr. Wickham Flower, which was stated to have been dug out of the brick-earth near Sittingbourne, along with the Mammoth and other pleistocene creatures; the bones of an Ostrich brought to Prof. Busk, along with Mammoth and Hippopotamus from the gravels of Acton Green; and lastly, the skeleton of Fallow Deer found in a bog not far from the

River Boyne above Leinster Bridge (Co. Kildare), along with a skull of Brown Bear (Scott, Journ. Geol. Soc. Dublin, vol. x. p. 151). This last case would have been taken as decisive that the animal lived in Ireland in prehistoric times as a contemporary of the Brown Bear, had not a silver collar round its neck proved that it had belonged to "a member of Lord Rosse's family."

From premises so unsatisfactory as those which have been examined, it seems to me very hazardous to conclude with Dr. Jeitteles that the Fallow Deer inhabited Northern and Central Europe in the pleistocene and prehistoric ages. The point, to say the very least, is non-proven. On the other hand, the non-discovery of certain relics of the animal by the many able naturalists who have examined vast quantities of fossil remains from those regions, implies, to my mind, the probability that the animal was not then in those parts of Europe. The value of negative evidence depends upon the number of observations, which in this case is enormous. To speak personally, I am in the position of a man waiting for satisfactory proof, holding that up to the present time the common Fallow Deer "has never been found to occur in the fossil state in Northern and Central Europe. The animal *ought* to be found fossil in those regions; and it is not for want of looking that it has not yet been found.

For the sake of clearness, I have reserved the reference to other forms of deer, in the essay, for separate discussion. The *Cervus polignacus* of Pomel, from Auvergne, is an obscure form without definition, about which I will not venture to say anything. The *C. somonensis* of Cuvier, which I have carefully studied in Paris along with Prof. Gervais, is identical with the form which I have described from Clacton, Essex (Quart. Geol. Journ., 1868, p. 514), under the name of *Cervus Brownii*. The latter has been identified by Prof. Busk among the fossil remains from Acton Green. The typical antler of Cuvier's species differs from plate xvii., fig. 4 of *C. Brownii*, in the possession of a palm of four points, and in being broken and badly restored with plaster at the point where the third tine, *d*, of my figure joins the beam. Whether this kind of antler belongs to a well-marked variety of Fallow Deer or to a closely-allied species, I will not offer an opinion. It seems, however, safer to follow Professors Lartet, Gaudry, and most of the naturalists since the days of Cuvier, in keeping the fossil separate from the living forms, none of which present, so far as I know, a similar

variation of antler. Till such an antler be found it is better to keep the animals apart in classification. And even if they be viewed as belonging to one species, they have only been met with in pleistocene deposits in this country and in France, and they may reasonably be taken as visitors from the south, such as the contemporary *Hippopotami*. In any case, I would submit that they do not afford satisfactory grounds for believing with Dr. Jeitteles that the present distribution of the Fallow Deer in Northern and Central Europe by the hand of man is "an ancient fable." It is undoubtedly an ancient belief, and it is one which can be proved to some extent to be true by an appeal to the records of history.

To enter into the question of the introduction of Fallow Deer into Northern Europe would far outleap the limits of an article. A reference to Lenz's 'Zoologie der Alten,' and to Neckham's 'Natural History,' will show to what an extent the wealthy Romans and mediæval barons were in the habit of importing wild and rare animals for the chase, as well as for the sake of mere curiosity.

Sir Victor Brooke, writing "on the existence of the Fallow Deer in England during pleistocene times" ('Nature,' 14th Jan. 1875), has shown pretty conclusively that the species called *Cervus Brownii*, which was founded by Prof. Boyd Dawkins (Quart. Geol. Journ., 1868, p. 514) upon some abnormal antlers dug up at Clacton in Essex,* is identical with *Cervus dama*, and that "under the former title the fact of the existence of the Fallow Deer in England during the pleistocene period lies in some degree obscured."

In this determination Prof. Boyd Dawkins himself has since expressed his concurrence ('Nature,' 21st Jan. 1875), remarking that Sir Victor Brooke's essay leaves no room for doubting that "the antlers named in the books *Cervus Brownii* and *C. somonensis* really belong to a variety of the living Fallow Deer," and he thanks the author "for having brought forward evidence on the point which is not presented by any of the large series known to me in the British and Continental Museums, and without which I could not venture to identify the fossil with the living form. He has supplied the missing link hitherto sought in vain, and thereby removed two synonyms from the bulky catalogue of fossil Mammalia."

* Other specimens of this so-called species have been identified by Prof. Busk amongst the fossil remains from Acton Green.

But this has little to do with the question raised by Herr Jeitteles, namely, whether the Fallow Deer now living in Northern and Central Europe was introduced—like the horse into South America—by the hand of man.

On this point Sir Victor Brooke says (*l. c.*):—"Whether the Fallow Deer became extinct in Northern Europe before the advent of prehistoric man, or whether it continued to exist in these islands even at the commencement of the Roman occupation, are questions beside that of the truth of the "ancient belief" to which Mr. Boyd Dawkins shows such firm allegiance. "In either case the species may have been reintroduced by the Romans, a people whose magnificently lavish expenditure upon luxury and pleasure despised bounds."

While on the subject of Fallow Deer, it will not be out of place to call attention to the fact that the Fallow Deer of Western Persia (and therefore presumably the animal found in Western Asia, referred to by Herr Jeitteles) has been shown by Sir Victor Brooke to be a larger animal distinct from *Cervus dama*. He has described and figured it under the name of *Cervus mesopotamicus* (Proc. Zool. Soc. 1875, pl. xxxviii.) from specimens procured in the Provinces of Khurzistan and Luristan, in Western Persia, at the head of the Persian Gulf.

The peculiarity of this species lies chiefly in the shape of the horns, which are palmated immediately above the burrs, with a strong cylindrical beam rising from the posterior corner of the palm, and terminating in three well-developed tines. In other words, the cylindrical beam is *above* the palmation, or precisely the reverse of what obtains in *Cervus dama*.

Sir Victor Brooke says:—"In the development from the fan-shaped palm of a definite strong cylindrical beam, terminated with points, the new species presents a type of horn which stands unique amongst existing *Cervidæ*."

ORNITHOLOGICAL NOTES FROM NORFOLK.

BY HENRY STEVENSON, F.L.S.

JUNE, 1876.

Pheasant.—A hen Pheasant hatched off her brood on the 2nd, in a nest made in the ivy growing against the east wall of Northrepps Cottage, about twelve feet above the ground, and brought off five chicks, two or three others being killed by the descent.

Hooded Crow.—One observed at Northrepps on the 22nd.

Spoonbill.—A single bird seen early in the winter on Breydon.

Rednecked Phalarope.—A male bird killed at Yarmouth on the 19th.

AUGUST.

Great Crested Grebe.—By a strange chance two old Grebes and three young ones were killed, at one shot, on Rockland Broad, on the 1st of August. The young were still in the down, with striped heads and necks, either a second brood or a late hatch, owing to the first nest being destroyed.

Turnstones and Sanderlings.—At Cromer, on the 15th, I saw a flock of Turnstones passing sufficiently near the beach to distinguish, with a glass, that they were all in nearly full summer plumage, as also was a specimen shot at Blakeney two days before. Sanderlings shot at the same time and place were adults in summer plumage.

Richardson's Skua.—A single bird was seen off Cromer as early as the first week in August.

SEPTEMBER.

Nocturnal Migrants.—Heard the whistling of birds over the city for the first time this autumn about 8.30 P.M. of the 10th, apparently some small *Tringæ*, but very far off. Wind N.N.W., with a dark sky, but starlight.

Osprey.—One shot at Guist on the 24th. A male on South Walsham Broad on the 28th; and another at Sennowe about the same date. The latter had frequented the neighbourhood for some days.

Honey Buzzard.—An immature female was killed near Diss on

the 16th. It was said to have struck down a Partridge, and both birds were secured.

Hobby.—One shot this month at Fersfield, near Diss.

Common Buzzard.—One shot at Horningtoft on the 22nd.

OCTOBER.

Little Stint.—Several shot at Salthouse during the first week in the month, and others on the 26th, from a flock of about forty.

Purple Gallinule.—A bird of this species, in full plumage, was shot on a stream near Pinckney, in West Norfolk, about the 10th of October: most probably an escaped bird, but a public notice of its fate in the local papers has failed to find an owner for it.

Mealy Redpoll and Siskin.—Several of these birds, which appeared altogether absent last autumn and winter, were netted near Norwich about the middle of this month, and I saw a single male Siskin which had been taken with some Lesser Redpolls as early as the second week in September.

Pigmy Curlew.—Several shot on Breydon during the first week of October.

Buzzards?—Two large Hawks seen at Northrepps on the 5th, supposed to be Honey Buzzards. A Rough-legged Buzzard was seen at the same place on the 30th.

Sky Larks Migrating.—A very large flock of these birds was seen at Northrepps going S.W. by W. on the 12th.

Magpie.—A single bird killed at Gresham, by Holt, on the 14th.

Peregrine.—A fine bird, in nearly adult plumage, was sent up to Norwich on the 30th.

Short-eared Owl.—A very unusual number of these autumnal migrants appeared in various parts of the county between the 20th and 31st of October, at which time I saw between twenty and thirty specimens in our birdstuffer's hands. One bird is said to have had the remains of a Great Snipe in its stomach.

Shore Larks.—These annual winter visitants, as they may fairly be termed now, on the Norfolk coast, made their appearance at Yarmouth this month in a large flock, of which five, three males and two females, were sent to Norwich on the 27th. Another flock is said to have frequented the beach and "back-water" at Salthouse.

Woodcock.—These birds were plentiful towards the end of the month, upwards of twenty were hanging for sale in our fish-market on the 28th.

NOVEMBER.

Lapwing.—Two large flocks of these birds were seen at Northrepps on the 1st, going west, and on the 4th large numbers were observed passing W.N.W., and from their cries it would seem that their flight continued also during the night of the 4th, or at least some part of it. About the 15th immense flocks of Lapwings and Golden Plovers were observed in the same neighbourhood at Beeston Regis, and up to the close of the year the numbers of both Golden and Gray Plovers reported on the western side of the county, at Lynn, have been very unusual.

Peregrine.—One shot at South Walsham early in the month.

Bittern.—A single example was killed somewhere in the county on the 4th, and one at Beccles about the middle of the month.

Rough-legged Buzzard.—An immature bird killed at Sidesstrand, near Cromer, in the first week of November, was no doubt the same observed on the 3rd at Sheringham, mobbed by a Hooded Crow, and on the 4th at Northrepps, all closely adjoining. I have also seen three other specimens, all immature, killed in Norfolk during this month.

Wood Pigeon.—On the 3rd of this month, and again on the 12th, 13th, and 14th, very large flocks of Wood Pigeons were observed at Northrepps early in the morning, apparently coming in from the sea.

Sea Eagle.—A single bird was seen at Sheringham, and subsequently at Beeston Regis, about the 9th of this month.

Common Guillemot.—On the morning of the 2nd a Common Guillemot was taken alive in the garden of the Rev. Mr. Norgate, of Sparham, near Norwich. It was found flapping along the walks, apparently fatigued, but uninjured. There had been much wind a night or two before from the west and north-west, but on the previous night by no means sufficient to account for its appearance, so very far inland, by the supposition that it had been caught in a gale, and so involuntarily carried away from the coast.

Honey Buzzard.—Mr. Baker, of Cambridge, informs me that on

the 6th he received a Honey Buzzard for preservation, from Fordham, near Downham Market, in Norfolk; one from Caxton, in Cambridgeshire, on the 8th; and one, same time, from near Sudbury, Suffolk—all young birds.

Snowy Owl.—About the 2nd or 3rd a fine specimen, which had evidently been previously wounded, was shot by Lord Leicester's keeper in the Burnham Overy marshes, the same recorded in 'The Field' of November 18th.

Gray Phalarope.—A bird fast assuming its winter plumage was killed early in the month.

Purple Heron.—A young bird of the year was killed at Ranworth on the 10th. It had been previously shot at and wounded in the leg.

Purple Sandpiper.—An adult specimen was shot at Yarmouth on the 8th, another later in the month at Blakeney, and a young bird at the same locality on the 31st of October.

Raven.—On the 26th two Ravens were seen coming over the sea at Overstrand, near Cromer. Mr. N. F. Hele also records in 'The Field' of November 24th having seen three Ravens at Aldborough.

Sclavonian Grebe.—A bird in full winter plumage was shot at Ranworth about the 14th.

Hawfinch.—The Rev. E. T. Frere, of Burston, near Diss, informs me that during this month about thirty Hawfinches were killed in the same garden, at Diss, where this species appeared in such numbers two years ago, attracted no doubt by the number of yew trees. He fortunately succeeded in putting a stop to this useless slaughter.

Lesser Spotted Woodpecker.—A bird of this species was killed in the same garden above referred to, at Diss, on the 24th.

DECEMBER.

Common Buzzard.—A rich brown-plumaged bird was brought up to Norwich on the 2nd.

Rough-legged Buzzard.—One shot at Ditchingham on the 1st, another at Northrepps in second year's plumage on the 24th, and two near Yarmouth between the latter date and the 29th—all immature birds. On the same day an unusually dark-coloured Buzzard, supposed to be of this species, was seen at Northrepps.

Gray Shrike.—One of these birds was killed in the county this month, and two others in November.

Sea Eagle.—One recorded in 'The Field' of January 6th, 1877, as killed on the Westacre estate, near Swaffham, Norfolk.

Snipe and Wild-fowl in the Early Winter.—The beginning of November was remarkable for the very unusual number of snipe which were met with at that time on our broads and marshes, and large bags were made by those fortunate enough to hear of their arrival in time to take advantage of it. From fifteen to five-and-twenty couples in a day were, I understand on good authority, killed in favourable localities, and this not only in the Broad District, but in the salt marshes on the coast: these birds, according to some accounts, literally poured in upon us, just in advance of the sudden change to frost and snow, which commenced on the 6th and lasted till about the 11th or 12th. From that time, as was the case last year under very similar circumstances, both snipe and fowl have been scarce, the weather remaining open, whilst these early flights have passed on to the south, to return only in March on their way northwards in Spring. Early in the month wild-fowl were reported as unusually plentiful at Salthouse, and on the 9th wild swans were seen off Blakeney; and about a week later others were seen out at sea, off Cley Harbour. On the 9th a flock of over two hundred wild geese flew over Northrepps, in a N.W. direction, flying high and making much noise, and about the same time I learn that fowl in unusual numbers were heard passing over Breydon, near Yarmouth, but the nights were too dark for the gunners to do anything with them. Inland, and within a mile or two of Norwich, wild swans were seen on the wing, and a great many fowl frequented the low meadows both morning and evening. The great abundance at the same time of Golden and Green Plovers, has been already referred to, but Fieldfares and Redwings have not showed in force this winter, nor have any of our smaller resident species suffered privation, owing to the brief duration of frost, and the remarkable mildness and damp of the season generally.

OCCASIONAL NOTES.

ON THE BREEDING OF THE OTTER.—Although Otters, like other animals, appear to breed most commonly in the spring, yet instances of the capture of young Otters that must undoubtedly have been born during the autumn seem to be nearly as common, and I think a series of instances would show that there is no month in the year during which a newly-born litter could be considered extraordinary. On November 12, 1873, a male cub, picked up in the Isis a few days before, weighed (at a guess) barely 2 lbs. : he had milk canines and molars, but no incisors cut (it may be worth mentioning that he did not lose the first of these milk canines until a day or two, at most, before January 22) ; he had probably not many days before emerged for the first time from the nest, and if it be correct, as stated by Brehm ('Illustrirte Thierleben') and quoted by Lilljeborg, that the young are suckled by the mother for a couple of months in the nest before they are taken out and instructed by her in the art of catching fish, nine weeks would be somewhere about his age. Two other cubs, male and female, were captured a few days after the first, making a probable total of three to the litter. On March 31, in the same year, a female cub, picked up about the 20th, in Wales, weighed $2\frac{3}{4}$ lbs. ; she had incisors, evidently not long cut. Two cubs, weighing about 3 lbs. each, were killed on October 24, 1875, while trying to scramble up a willow-tree in the floods near Oxford. Two others were caught from a fishing boat when swimming with their mother in the sea, off Megavissy, Cornwall, on February 4th, 1873 (as reported in 'Land and Water' at the time); one of these, which I found lying dead in its cage at the Zoological Gardens on the 24th, weighed then, at a guess, about $3\frac{1}{2}$ lbs. On July 10th of the same year I caught a young female Otter in the Thames, weighing somewhere about 5 or $5\frac{1}{2}$ lbs., and on comparing it with the specimen mentioned above as received from Wales in March of this year, it appeared to be from a month to six weeks younger. Two cubs were caught with Major Hill's otter-hounds in Wales in 1870 ; one, a female, weighed on July 23, 5 lbs. 14 oz. Four young Otters, from different localities, appeared to be of much the same age—averaging about 9 lbs.—(one weighed 8 lbs. 6 oz., and was 3 feet 2 inches long, another $9\frac{1}{2}$ lbs., length 3 feet 1 inch) in the months of June, August, May, and December. The friend who sent me these wrote me word that he had tried to procure a cub, caught a few days previously, which was not much more than half the size of the specimens sent. The mother of another of these had, according to the fisherman who shot her, three teats used, as if that were the number of young in the litter. Three small cubs were killed, together with their mother, in their nest under a stack of osiers on one of the eyots on the Thames ; I do not know the time of year. A female Otter, trapped on the

Thames, was found by the man who skinned her to contain three young; I regret that in this instance, as in two or three others of single cubs being picked up, I have no note of the time of year. One of the two Otters now in the Zoological Gardens, received in February last, must undoubtedly, I think, have been born during the previous autumn. Two female Otters, which I have in captivity, come in season pretty nearly every month, and would, I believe, pair at almost any time of year, especially perhaps November, but unfortunately I cannot get hold of a male; the only individual I ever possessed (the first cub mentioned) died from inflammation of the lungs before he was full-grown.—ALFRED HENEAGE COCKS (5, Radnor-place, Hyde Park, W.).

HYBRID BETWEEN THE ENGLISH HARE AND THE SCOTCH HARE.—At a recent meeting of the Glasgow Natural History Society Mr. Lumsden exhibited a Hare, hybrid between *Lepus timidus* and *Lepus variabilis*, which was shot in December last near Dumbarton moor, where blue Hares were turned out a few years ago. He remarked that "the editors of the new edition of Bell's 'British Quadrupeds' do not seem to have been at all sure of hares of this description occurring in this country, and state that hybrids are reported to be known in Switzerland, but that the statement requires further confirmation. It is reported, however, that they are not uncommon in some places in Perthshire." Mr. John Cordeaux, of Great Cotes, Ulceby, informs us that when shooting in Perthshire last September, he killed a hare which he had no doubt was a cross between *Lepus timidus* and *Lepus variabilis*. This example, which he compared the same day with pure specimens of both species, exhibited very distinctly a mixture of the colours of both parents, that of the Common Hare predominating. It differed, also, in some respects from the Mountain Hare, being generally larger, with larger head, larger ears, and broader forehead. The head keeper on this moor, an experienced man, stated that there was no doubt whatever about the inter-breeding of the two species, but that the progeny was infertile.

—ED.

A FRESHWATER BREEDING-HAUNT OF THE SANDWICH TERN.—A correct list of the breeding stations of some of our rarer sea-fowl would be both interesting and useful to those who are fond of studying the habits of our native birds; for in many instances the localities chosen are not those where the casual observer might be induced to look for them. Few, indeed, would expect to find the Sandwich Tern nesting on a little moorland lough some miles from the sea, and totally unconnected with it; yet such was the locality selected by the Sandwich Terns frequenting Killala Bay and the estuary of the River Moy. On the 7th of April, 1851, near the island of Bartragh, I first became acquainted with this beautiful Tern. Having previously resided in the South of Ireland it was quite unknown to me, and when the attention of my brother and myself was first attracted by

its very peculiar cry (which if once heard can never be mistaken or forgotten) we were very much puzzled, as for a long time we could not make out what bird uttered it, or from what direction it proceeded. The sound appeared to come from all points of the compass, yet no birds appeared in sight: after some time we chanced to look upwards, and were only just able to perceive some birds wheeling about and soaring at an immense height, and all the while screaming loudly. This wild flight and strange cry, so unlike that of any other bird we knew, induced us to watch them closely, and after some time they gradually lowered their flight to the water, and we then saw that they were some species of Tern. We got into our boat, and succeeded in shooting a couple, and found they were the Sandwich Tern. This peculiar habit of soaring to a great height (almost out of sight) and wheeling about in wide circles, occasionally chasing each other and screaming loudly, is more often to be witnessed early in the season, before they begin to sit, although occasionally in autumn a pair may be seen acting in a similar manner, but almost invariably on fine bright days. As these Terns remained feeding about the bay and estuary, we were most anxious to find their breeding ground, but although we made many enquiries and searches we were unable to discover it. About the time we supposed the females were hatching, the male birds were daily seen flying inland towards Lough Conn, with sand-eels in their bills to feed their mates. Lough Conn, however, was visited twice without our seeing any trace of the Sandwich Terns, the only members of the *Laridae* met with being Black-headed Gulls and Common Terns. Our search for the breeding haunt having thus failed I gave it up for a time, but in May, 1857, I was told of a small lough upon which a number of small gulls bred, and which is situate near the residence of the late Mr. Gardiner, of Cloona, two miles from the town of Ballina, and about three miles from the estuary. This lough, nearly surrounded by a bog, is about twenty or thirty acres in extent, and has a wooded island in the centre, with a quantity of reeds and bulrushes at one end. On visiting the spot I found a large colony of Black-headed Gulls breeding amongst the reeds, and a smaller colony of the Sandwich Terns located on a low flat mud-bank scarcely above the level of the water. Some of these Terns had no nests to speak of, but had laid their eggs in a slight depression of the soil, thinly lined with a few blades of dried grass, and (as well as I can remember now) I think three was the average number of the eggs in each nest. When returning I brought five or six of the eggs back with me, and at that date (the last week in May) some were nearly hatched, and too far advanced for blowing, which shows that this species breeds much earlier than the smaller terns. The following winter and spring being unusually wet, the level of the lake was raised so high as to cover the mud-bank upon which the Terns had had their nests, and as the bank continued under water during

the summer of 1858, the Terns deserted this lake altogether. They have now moved to the little moorland lough of Rarouem, situated midway between Ballina and Killala, and within sight of the high-road between those towns. This lough is considerably larger than that of Cloona, but is nearly surrounded by bog, with very swampy shores, and a large quantity of reeds growing on the margin: in some places these reeds grow far out towards the centre, where there is a small circular island about twenty yards in diameter, whereon a large number of Black-headed Gulls make their nests, as they do also among the reeds, but the Terns have theirs on a bare part of the island, a little away from those of the Gulls. This lake, with the adjoining land, is the property of Sir Charles Knox Gore, who, with the spirit of a true naturalist, strictly preserves it, and does not permit either Gulls or Terns to be disturbed: last season he had the bushes and long grass cut off the island, in order to give the birds more space for their nests, so that now, being well protected, there is every likelihood of this beautiful species increasing every year. When visiting this lough in June, 1876, it presented a most pleasing sight from the number and variety of the birds frequenting it; the Gulls and Terns sitting on their nests, the male Terns continually coming from the sea with sand-eels to feed their mates, Wild Ducks, Teal, Coots, and Waterhens swimming in and out amongst the reeds, Ring Plovers running along the shores of the lake, and Black-headed Buntings and Sedge Warblers flitting about the stunted bushes which grow on the drier parts of the swamp. Altogether it presented as pretty a picture of lake life as could well be imagined, and one of which a naturalist could never tire. The Sandwich Terns arrive in the bay and estuary of the Moy much earlier in the spring than the smaller terns, generally making their appearance between the last week of March and the middle of April; sometimes, however, I have seen them arrive as early as the 20th of March, and as late as the 26th of April.—ROBERT WARREN (Moyview, Ballina).

ON THE HABITS OF THE GOLDEN EAGLE.—I have never known the Golden Eagle to eat fish, even when quite fresh, much less in a putrid state. The Sea Eagle, on the contrary, is a foul feeder, and will eat all kinds of fish; he also watches the fords over which salmon leap in ascending rivers, and often makes them his prey. Few have enjoyed better opportunities than I have for studying the habits of the Golden Eagle, for they frequent the hills around my house, and for the last twenty-four years I have had a tame one, which seems to attract the wild ones, who sometimes sit on the top of her cage. In 1875 she laid two eggs, and last year four. She is much attached to me, and will allow me to handle her in any way. So far from being afraid of anything alive, I may state that she has killed a Peregrine Falcon, which was so tame that I allowed it to fly about, besides several Merlins, Gray Crows, and other pets that I had, which went into

her cage attracted by the meat. Only last month she killed a large cat in the same way. I could furnish many other anecdotes of her did space permit. The mode of hunting by the Golden Eagle is most interesting to watch. Generally speaking two of these birds hunt together, a hare being the favourite prey. When the hare is started one of them follows it as near the ground as possible; the other poises in the air, or as a falconer would say "waits on," and watches intently. If a rock or anything else intervenes, and the bird in pursuit loses sight of the hare, the other at once stoops and takes up the running; the first then "waits on," and so on. The hare has little chance of life unless there is a hole in which to hide.—
WILLIAM PIKE (Glendarary, Achill Sound, Co. Mayo).

NOTES FROM THE WEST OF ENGLAND.—A Rough-legged Buzzard is reported to me as having been trapped on Exmoor this winter; it is described as having been very light-coloured in its plumage, so may prove an adult. At the beginning of November a Green Sandpiper made its appearance by a warm drain close to my house, and was to be noticed there daily for some six weeks, when it disappeared, and I feared it had been shot; however, after a fortnight's absence it returned, and one day I flushed from the same drain a smaller Sandpiper, which seemed tamer than the other bird, rising with a feeble "weet," and flying over the field at a short distance from me. I am pretty positive that it was a Wood Sandpiper. About Christmas a Curlew Sandpiper was shot on the moors a little to the east of Taunton, and is, I should judge, in almost complete winter dress, in which state it is but rarely obtained in this part of the kingdom. It is not so gray on the back as the Dunlin in its winter plumage, and still shows many of the crescentic markings which characterize the young birds shot in September and October; but all the under parts from the bill to the vent are pure white, and the upper wing-coverts are very hoary, being dark gray spotted with white, not a little resembling the summer plumage of the Wood Sandpiper. Whilst on the subject of Sandpipers I may add that last summer, when fishing on the moors, I saw a Common Sandpiper rise a few feet into the air from off a bank adjoining the stream, and while it rose and slowly descended again it warbled a very agreeable little song; a clump of furze separated me from the bird and the stream by an interval of a few feet, so that the bird did not see me, while I was sufficiently near to see it clearly and to catch what was to me a hitherto unknown song. It is on record that the Wood Sandpiper also pipes a few pleasing notes.—MURRAY A. MATHEW (The Vicarage, Bishop's Lydeard).

RARE BIRDS ON THE EXE.—An adult specimen of the Little Gull (*Larus minutus*), in winter plumage, which had been shot near Woodbury, was shown to me in the flesh on the 20th November last. On the 12th January two immature specimens were shot on the Exe, below Topsham, by Mr. Douglas Hamilton and Mr. Benjamin Cleave, who have kindly presented

them to this Museum. Another immature specimen has also been shot within the last few days at Turf, on the Exe. This species has occurred three times previously on the same river, once at Teignmouth, twice in Torbay, and twice at Plymouth. A Great Crested Grebe (*Podiceps cristatus*) in winter plumage was shot at Powderham, on the Exe, on the 15th January, by Mr. A. K. Hamilton, who has presented it to this Museum; it is not common on the Exe, but has been obtained in various stages of plumage, principally in the early months of the year. On the 18th December last a young male Long-tailed Duck (*Harelda glacialis*) was brought to me in the flesh; it had been killed on the Exe. We have now a fine series in this Museum killed on this river: an adult male in summer plumage (1847), an adult male in winter plumage, a young male (1851), another young bird (1865). A small flock of these ducks was seen on the Exe in November, 1867.—W. S. M. D'URBAN (Albert Memorial Museum, Exeter).

ROOKS ATTACKING ACORNS.—Your remarks on Rooks attacking acorns (page 21) reminds me of what came under my observation some twenty years since, when residing in Morayshire. I made some notes on the subject at the time, and now give an extract, thinking it will go far to prove that the Rooks you saw carrying off acorns were doing so to get at the grubs. The past autumn having been unusually mild, the thermometer in November frequently as high as 55°, grubs and worms were unusually abundant, consequently Rooks could not have been pressed by hunger to feed on acorns. Seeing that the Nuthatch breaks the hazel-nut, we need not wonder at the Rooks breaking the shell of the walnut. The note to which I refer is as follows:—"November, 1858. Observing a number of Rooks flying in and out of a fir plantation, and remarking that they were more than usually clamorous, I was induced to watch them; I then found that on emerging from the wood they held in the beak something of considerable size, but what it might be I could not imagine. Snails were thought of, but it being late in November they were hibernating, so I endeavoured by a closer inspection to ascertain what could have been found of an eatable kind in the fir-trees, but the closely-matted branches effectually screened them. On leaving the wood they were observed to alight on an open space dotted with furze, under cover of which I was enabled to watch them unobserved; I then saw that what they were pecking and tearing at were fir-cones; the operation over—and it took but a few minutes—they returned to the trees for a fresh supply. On examining several of the cones strewn over the ground in different stages of decay, a grub, or maggot, was found in some of them near the core, showing clearly on what the Rooks had been feeding."—HENRY HADFIELD (Ventnor).

ROOKS ATTACKING ACORNS.—Like Mr. R. M. Barrington I had never noticed that acorns were not included by the authorities on British Birds

in the category of the Rook's food. I have repeatedly seen them eat acorns, but was under the impression that they eat all but the outside shell. Rooks and Carrion Crows begin to come to our walnut trees on or about the 28th September every year. They wrench off the nut, and sometimes carry it to a great distance before they commence to eat it. They generally take it to the middle of some large field, and holding the nut down firmly by one claw, proceed to peck it open by aid of their powerful beak. It is impossible to make one drop the coveted morsel when flying over, however much they are frightened. I never saw them bury a walnut, as related by Mr. Jesse.—C. MATTHEW PRIOR (Bedford).

CURLEWS BREEDING NEAR SALISBURY.—I can quite credit the paragraph in 'The Marlborough Times,' mentioned at page 38, concerning the true Curlew (*Numenius arquata*) breeding occasionally on the Aldbourne Downs. One or two pairs have bred regularly on the downs some seven miles from Salisbury for many years past. My little boys taking a great interest in Natural History, I asked a friend, in the spring of 1875, to procure for me a pair of the eggs of the Stone Curlew, or Thick-knee, which bird breeds annually with us. He did so, but they unfortunately arrived when I was away from home, and were broken. He very kindly sent me a second pair on May 25th,—rather late in the season for them,—and told me whence he had procured them. On making enquiries of a person he mentioned, I was told that they were not uncommon, and that some Curlew's eggs could be obtained from the same downs if I wanted them, as one or two pair bred there every year. I was surprised at hearing it, but size and colour and shape of the egg were described so accurately that I was convinced of the truth of their doing so. Last year (1876) I asked the person to look out for me and procure me some; but this spring none were found, it being the first season they had missed breeding there. Upon this I referred to Meyer's book on 'British Birds and their Eggs,' and asked the person to point out to me which eggs were meant when "Curlew's eggs" were spoken of; and the right egg was pointed out without the slightest hesitation. I have not the least doubt of the fact of these birds breeding on the downs, as the Thick-knee's eggs are comparatively common about here, and could not be mistaken for the eggs of *Numenius arquata* by one who was perfectly acquainted with the eggs of both species.—A. P. MORRES (Britford Vicarage, Salisbury).

VARIETY OF SAND MARTIN.—This species breeds not uncommonly in several places in the neighbourhood of Ringwood, such as old gravel-pits or railway banks. Near one of the latter situations I have often sat for hours watching their untiring and happy motions and listening to their twittering notes. Last season, during their nidification, I noticed a peculiarly coloured individual flying amongst its darker relations—in fact, it seemed to be snowy white, and was consequently very conspicuous. On the 6th of

September, however, I saw a specimen which had been killed as it was flying over the river, but it was terribly battered with large shot, its head being smashed and almost severed from the body. Its general colour was a pale yellowish white, the body tinged with gray, and the feathers of the wing-coverts were each bordered with bright rust-colour, so that it would have been a peculiar variety if it had been worth preservation. This was probably the bird I had watched during the summer, for although the man who shot it said he saw another at the same time similarly coloured, no such specimen was seen afterwards.—G. B. CORBIN.

GRAY SHRIKE AND GOOSANDER IN COUNTY ANTRIM.—A female specimen of the Great Gray Shrike was shot at Carnmoney, County Antrim, on January 13th; the stomach contained fragments of the bones of some small bird, but of what species I could not determine. On the 9th of the same month a young male Goosander was killed ou the six-mile water near Randalstown, and came into my possession the following day.—THOMAS DARRAGH (Belfast Museum).

[In Thompson's 'Birds of Ireland' the Goosander is characterised as "probably an annual winter visitant to Ireland, but in very limited numbers; and chiefly to fresh water."—ED.]

OWLS WASHING.—I have a pet Barn Owl flying at large in the yard, and on several occasions I have seen him wash in a tub of water. I have also a Long-eared Owl, but never knew him to wash, although he sits outside in rain and wind both night and day, and seldom seeks shelter or even a dark corner; it is quite the contrary with the Barn Owl, as he does not seem to like the light, and seeks the cellar in the day-time. It would be of interest to me to know if others have observed Owls washing, and if so, of what species?—THOMAS DARRAGH (Belfast Museum).

[That Owls have no antipathy to water is evidenced by the fact that they have been observed to catch fish, and in their love of bathing, when opportunity serves, they probably do not differ from other birds of prey.—ED.]

REMARKABLE VARIETY OF THE WILD DUCK.—On the 11th January a strange specimen of the Mallard was submitted to my inspection. The head was yellowish green, the white collar absent from the neck, very slight traces of the rufous band on the breast, speculum ashy black instead of brilliant green. It was shot below Topsham, on the Exe, a day or two before I saw it.—W. S. M. D'URBAN (Curator, Albert Memorial Museum, Exeter).

[Our first impression on reading this note was that the bird must have been a drake in the plumage of a duck, still undergoing that remarkable seasonal change of plumage to which we know the Mallard is liable at the close of the nesting season. But looking to the date at which it was obtained, this could scarcely have been the case. The Mallards begin to assume the duck's plumage about the third week in May, and retain it

until August, when they again undergo a gradual change towards their own richly-coloured plumage, which is fully re-assumed about the second week in October. The bird in question, therefore, ought to have been in the full plumage of the drake at the date named, and it must accordingly be regarded as an abnormal variety, if our correspondent has satisfied himself that it is not a hybrid, or an escaped wanderer from some poultry yard.—ED.]

HERONS NEAR LONDON.—One morning in December, 1876, a Heron was seen by Mr. F. W. Denny fishing in his piece of water in Hanover Park, Peckham.—HENRY F. BAILEY.

[The spot indicated is about four miles from Hyde Park Corner. On the 10th February last we saw a solitary Heron at Kingsbury Reservoir, which is about six miles from Hyde Park Corner as the bird flies.—ED.]

GLAUCOUS GULL ON THE EXE AND TEIGN.—An immature specimen of the Glaucous Gull (*Larus glaucus*) was shot on the Exe on the 20th January. It had been seen for a fortnight previously, and had been frequently fired at. Another specimen, also immature, occurred on the Teign about the same time. The legs and feet and base of the bill were light pink in the first-named specimen, which is now in this Museum.—W. S. M. D'URBAN (Albert Memorial Museum, Exeter).

SINGULAR NEST OF THE BLACKBIRD.—On the 13th May, 1875, I came across a Blackbird's nest, on the ground, that must have wasted the time and tested the patience of the builders very considerably. It was in the bottom of an old lime quarry, placed on a sloping bank, with too little solid foundation, and the materials of the nest kept slipping down the side of the bank with their own weight, till a queue nearly two feet long and five inches wide was made. At the head of this it was at length triumphantly completed, and on the 17th May contained three eggs.—F. S. MITCHELL (Clitheroe).

OCCURRENCE OF THE SPINOSUS SHARK OFF PLYMOUTH.—On January 25th a Spinous Shark (*Squalus spinosus*), seven feet six inches in length, was captured in a trawl-net off Plymouth, and on being opened the stomach was found to contain four Picked Dogfish (*Acanthias vulgaris*). Although considered a rare fish this is the third obtained off Plymouth within the last eight years.—JOHN GATCOMBE (8, Lower Durnford Street, Stonehouse, Plymouth).

SPINOSUS SHARK IN MOUNT'S BAY.—On the 17th January a Spinous Shark was taken on a hook and line off Mousehole Island, in Mount's Bay, just where I observed the first specimen was captured about eight years ago in a similar way. The present specimen was eight feet long, but I had no time to take details. It was too much hacked about the head and gills for preservation. This makes the fourth Mount's Bay specimen that I have seen in eight years.—THOMAS CORNISH (Penzance).

TADPOLE FISH OFF PENZANCE.—A small specimen of *Raniceps trifurcatus* has been captured here. It was taken in a waterhole left by the receding tide, and was captured owing to its pugnacity, which may be common to the species or peculiar to the individual. It was heard splashing about in its hole, a stem of seaweed was thrust in, and the fish laid hold of it and was dragged out by it.—THOMAS CORNISH.

ASTERINA GIBBOSA ON THE COAST OF BANFFSHIRE.—While walking along the shore at Banff with some friends in May last, I noticed a lot of rubbish which the fishermen had taken from their lines, and knowing from experience what treasures are sometimes to be met with in such places, I at once began to explore on the chance. The first two heaps yielded nothing new or of much importance; but in the third I was well repaid by the discovery of a fine specimen of the above-named little Starfish, *Asterina gibbosa*. I am not aware of the exact range of this species, having no book on the subject, nor do I know if it has hitherto been detected as occurring in the Moray Firth. This I know, however, that the specimen here alluded to is the first I have ever met with. If I may offer the advice of an old man, let me urge upon your readers who live by the sea and take an interest in marine forms of animal life, never to pass the spots where the fishermen clean their lines without first searching them well. They will not always be successful, that is not to be expected; but let them persevere, and they will sooner or later be rewarded for their trouble.—THOMAS EDWARD (Banff).

[There seems to be no previous record, so far as we have been able to ascertain, of the occurrence of *Asterina gibbosa* on the east coast of Great Britain. In Forbes' 'British Starfish' it is said to be "apparently confined to the western and southern shores of Britain," and the localities mentioned are Cornwall, Isle of Man, Ross-shire, Herm, Channel Isles, and all round the coast of Ireland. To these localities, Gray, in his 'Synopsis of Starfishes,' adds Plymouth Sound. The habitat now assigned to it by Mr. Edward, therefore, is new, and the fact is interesting as establishing the occurrence of this starfish much further to the north and east than has hitherto been supposed.—ED.]

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

January 18, 1877.—Prof. ALLMAN, President, in the chair.

Mr. Thomas Routledge and Mr. Samuel David Titmas were balloted for and duly elected Fellows of the Society.

The "Amphibious and Migratory Fishes of India" was the title of a very

able communication by Dr. Francis Day, a well-known authority on all that relates to the fishes of the region in question. He laid down the following propositions, and by facts endeavoured to substantiate them:—(1) That there are fishes in Asia which normally respire atmospheric air direct; (2) that these fishes possess respiratory organs having a lung-like function, and which is distinct from the gills; (3) that they are essentially amphibious, inasmuch as the accessory organs receive venous and return arterial blood into the general circulation without passing through the branchiæ or gills; (4) that this accessory respiratory sac is certainly not homologous with the swim-bladder of fishes, but is most probably so with the respiratory sac of amphibious reptiles. He gave numerous instances of forms which respire air direct, and can live for long periods after their removal from water, being but little affected by a bandage being placed round their gills preventing the use of these organs. He observed that in the *Saccobranchus* both a respiratory sac and a swim-bladder co-exist—the one along the muscles of the back, the other more or less enclosed in bone but possessing a pneumatic duct. The migrations of fishes at the commencement of monsoons are due to two causes—breeding purposes and a search for food. The aerial respiration of certain amphibious fishes he regards as a provision to enable those forms to migrate through moist grass and muddy channels. As soon as the rains set in and vegetation starts afresh, insects, worms, land mollusks and other invertebrates are revivified, and with this the fish restlessly seek change of locality and diet, in their search for quarters where these abound. As regards the sudden appearance of fish supposed to have fallen from the clouds, these are occasionally met with in a semi-decomposed state, and are doubtless carried by whirlwinds and storms from shallow waters into mid-air, whence they fall again in most unlooked-for situations. In other innumerable instances the apparently inexplicable profusion of fish in moist spots away from water is accounted for by the remarkable retention of vitality possessed by the mud-loving species, which emerge from torpidity into active life as soon as the waters return.

The Jelly-fish have lately been made the subject of study by Mr. J. G. Romanes, who read a second notice "On Varieties and Monstrous Forms of *Medusa*." He expressed surprise that among the group of Jelly-fish, at least the naked-eyed groups, with their low grade of organization and proneness to exhibit phenomena of budding or germination, examples of monstrous and misshapen forms are comparatively rare. In those cases met with by him, especially in the common *Aurelia aurita*, the deviations from the normal type always occurred in a multiplication or suppression (*i. e.*, abortion) of entire segments. This affects the segments of the umbrella in a remarkably symmetrical manner, whilst the ovaries and manubrium, to a certain extent, may or may not be implicated.

Feb. 1, 1877.—GEORGE BENTHAM, F.R.S., Vice-President, in the chair.

The following gentlemen were elected Fellows of the Society:—Messrs. George Boulger (Cressingham, Reading, Berks), Alfred S. Heath (Primrose-hill Road, N.W.), and William Meller (Sewardstone, Woodford Green, Essex).

Mr. Alfred W. Bennett exhibited and made some remarks on specimens of insects, illustrating mimicry. These species (*Vespa* and *Asilus*) were captured in Syria by Mr. N. Godman.

Curious and interesting examples of double Anemones, and of unusually large oak-leaves gathered near Croydon were shown and commented on by Mr. Samuel Stevens.

Sir John Lubbock, Bart., M.P., then proceeded to read the fourth part of his "Contributions on the Habits of Ants, Bees and Wasps." In this communication his experiments and observations related exclusively to different species of ants, and in the main were a continuation, though with considerable ingenious modifications, of his previous inquiries, to test the intelligence of these insects. In one instance, he filled a saucer with water, put a block of wood therein, and from the top of the block a horizontal wooden rod leading to a glass cell containing abundance of larvæ. A strip of paper was then placed as a kind of inclined plane between the latter and the nest. Another larger block of wood of an Γ shape, the horizontal arm of which overhung the glass cell with the larvæ, and merely separated by three-tenths of an inch from the latter, this space being occupied with a paper slip hanging right on to the larvæ; thus $\Gamma\perp$: there were two direct routes from the nest to the larvæ, which specimens of *Lasius niger* took advantage of and for several hours carried off larvæ from the cell. But no sooner was the three-tenths of an inch interval left open than the ants were foiled in access to the larvæ, and neither were they intelligent enough to drop three-tenths of an inch or congregate *en masse* to the same height, and thus form a connection whereby their companions could get at the desired food-store. Industry was conspicuously shown by one individual, which Sir John used to place in solitary confinement in a bottle as he left home for the day; but when liberated on his return home the creature immediately commenced labour. On one occasion, after a week's absence, the ant was no sooner released than it bravely entered on its larval-gathering propensities. It seems from other experiments that ants in difficulties within sight of their companions are by no means always assisted or relieved, any store of honey or other food having attractions of far greater interest for them. On putting some specimens under the influence of chloroform, little or no notice was taken of their insensible companions; in some cases even their friends pushed them out of the way; the tendency was to let their friends lie, but strangers were dropped over the edge of the board. It seems that to get ants properly intoxicated with spirit, for experimental purposes, is no easy matter, some recovering too quickly, and others remaining so thoroughly

drunk as to come under the rank of incapables. The sober individuals appear exceedingly puzzled at finding their friends in such a condition. As a rule, they picked them up and carried them to the nest, whilst strangers they threw into the water and drowned. In some instances, however, confusion ensued, for a few of the strangers were carried to the nest and friends were thrown into the water; but they did not return to the rescue of their friends, and occasionally they discovered the strangers in the nest and turned them out. Other interesting experiments were made to test the ants' recollection of friends, and Sir John expresses surprise that the ants of an entire nest evidently recognise and know each other. Even after a year's separation, old companions are recognised and amicably received, whereas strangers almost invariably are attacked and maltreated, even when introduced in the mixed company of old friends. There is a difference in this respect, however, among species; for while *Lasius flavus* behaves as above mentioned, *Formica fusca* shows a milder and much more courteous demeanour towards neighbours and strangers. In certain kinds of ants sight does not seem to be a very acute sense, inasmuch as the subjoined repeated experiments prove:—Food was placed a few inches from the nest on a glass slip, the straight road to and from which marked ants soon learned, but when the food had been shifted only a short distance from its first position, the same ants kept meandering in an extraordinary circuitous path from several minutes to half an hour before finding out the exact route from food to nest, and vice versa. A diagrammatic chart of the path pursued appeared as one mass of confused and intricate cross lines. Slavery in certain genera is a positive institution, the Amazon ants (*Polyergus rufescens*) absolutely requiring a slave assistant to clean, dress and feed them. Repeated and varied experiments go to prove that they will rather die than help themselves. There are also parasite attendants on the ants, the curious blind wood-louse (*Platyarthrus Hoffmannseggii*) being common in nests; but the ants pay little attention to them, and when migrating leave these scavengers behind. Certain Diptera of the family *Thoridae* are also parasitic on ants, Sir John having discovered some new species, the recently described *Thora formicarum* and *Platyphora Lubbocki* of Mr. G. H. Verrall.

A paper "On the Aspects of the Vegetation of Rodriguez" was read by Dr. I. Bailey Balfour, B.M., who, as Botanist, accompanied the Transit of Venus Expedition to that island in 1874. It seems that, like the Fauna, the Flora of Rodriguez has undergone very considerable changes, through human, subsidiary and local influences.

"The Fungi of the 'Challenger' Expedition" (third notice), by the Rev. M. J. Berkely, and "Tropical Ferns," by Prof. Harrington, U.S., were the titles of two other botanical communications which were taken as read.

ZOOLOGICAL SOCIETY OF LONDON.

February 6, 1877.—OSBERT SALVIN, Esq., F.R.S., in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of January.

Mr. Sclater exhibited and made remarks on some unnoticed characters in the original and unique specimen of Comrie's Manucode (*Manucodia Comrii*, Proc. Zool. Soc., 1876, p. 459).

Mr. Howard Saunders exhibited a specimen of the Panay Sooty Tern (*Sterna anæsthetia*), which had been obtained on the English coast, and was the first recorded occurrence of this bird in the British Islands.

Dr. A. Günther read a memoir on the Tortoises collected by Commander Cookson, R.N., during the visit of H.M.S. 'Peterel' to the Galapagos Islands. The main results of Commander Cookson's visit consisted in giving us a knowledge of the Tortoise of Abingdon Island (*Testudo Abingdoni*) and of the Tortoise of the North of Albemarle Island (*T. microphyes*).

A communication was read from Mr. Robert Collett, containing an account of his observations on *Phylloscopus borealis*, as met with on the Varanger Fjord and adjacent parts of Finmark.

Mr. Sclater read a note on an apparently new species of Spur-winged Goose of the genus *Plectropterus*, proposed to be called *P. niger*, founded on two examples living in the Society's Gardens, which had been presented to the Society by Lieut.-General A. V. Cunningham.

Prof. A. H. Garrod read a paper on the mechanism of the vertebral substance and on some effects resulting from the erect position of man.

A communication was read from Sir Victor Brooke, containing notes on the small Rusine Deer of the Philippine Islands, and giving the description of a new species proposed to call *Cervus nigricans*, of which a female example was recently living in the Society's Gardens.

A paper by Mr. O. Salvin and Mr. Ducane Godman was read, giving the description of twelve new species and a new genus of butterflies from Central America.

Dr. Günther gave an account of the Zoological Collection made during the visit of H.M.S. 'Peterel' to the Galapagos Islands, which had been worked out by himself and his assistants in the Zoological Department of the British Museum.

Mr. R. B. Sharpe communicated the description of a new species of Pheasant of the genus *Lophophasis* and of a new species of *Pitta* from the Lawas River, N.W. Borneo. Mr. Sharpe proposed to call the former *L. castaneicaudatus*, and the latter, *Pitta Ussheri*.—*P. L. Sclater.*

ENTOMOLOGICAL SOCIETY OF LONDON.

February 7, 1877.—Prof. WESTWOOD, M.A., President, in the chair.

The Secretary read a list of donations to the Library since the date of the last meeting, and thanks were voted to the donors.

Election of a Subscriber.

William Denison Roebuck, Esq., of Leeds, Hon. Sec. of the West Riding Consolidated Naturalists' Society and of the Leeds Natural History Society, was balloted for and elected a Subscriber.

The President nominated Messrs. J. W. Douglas, J. W. Dunning and Henry T. Stainton as Vice-Presidents for the ensuing year.

The President then delivered the Address, which he was prevented from delivering at the Annual Meeting, on the progress of Entomology during the past year, and which was ordered to be printed.

Exhibitions, &c.

Mr. F. Bond (on behalf of Mr. Cooke, of Brighton) exhibited another specimen of the North-American butterfly, *Danais Archippus*, taken during the second week of September last by Mr. Alford Wood, of New Close, Keymer, Sussex, flying over a field of clover near Hassock's Gate. This was the third specimen recorded as having been taken in this country; the first having been captured near Neath on the 6th September, and the second near Hayward's Heath on the 17th October, 1876, and recorded in the 'Entomologist's Monthly Magazine' for October, and in 'The Entomologist' for December, 1876.

The President brought for exhibition a specimen of the singular butterfly *Bhutanitis Lidderdalii*, Atkinson, from Bhotan. He also read a letter which he had received from Baron v. Osten-Sacken, referring to his paper on the genus *Systropus*, published in the last part of the 'Transactions' of this Society, in which he had stated that a species received from Natal (*S. crudelis*) had been bred from a cocoon resembling that of *Limacodes*, found on a tree of the genus *Mimosa*. The letter referred the President to a paper by Benj. D. Walsh in the 'Proceedings of the Boston Society of Natural History' (vol. ix., p. 300, 1864), in which he relates that he had bred a dipteron from a cocoon of *Limacodes hyalinus*. This dipteron, which he had communicated to Baron Osten-Sacken, proved to be the common North-American *Systropus* (*S. macer*, Loew), and was a remarkable instance of community of habit among insects of the same genus in far distant regions.

The President had also been informed by M. Ernest Olivier, of Moulin, who had recently visited Pompeii, that he had observed large numbers of *Bombylii* flying in company with a bee of which he had forwarded a specimen, but this proved to be an *Anthophora* (probably *A. nigrocincta*), and

not an *Andrena*, like those described in his paper in the last part of the 'Transactions' ("Notæ Dipterologicæ," No. 1).

Mr. M'Lachlan exhibited a case of a Lepidopterous larva sent by Dr. Kirk from Zanzibar, who had found it on a species of *Mimosa*. He considered it to be allied, probably, to *Psyche* and *Oiketicus*, and was remarkable on account of its form, which bore a striking resemblance to that of a flattened *Helix*. It appeared to be constructed of a substance resembling *papier maché*, with a smooth whitish external coating.

Mr. C. O. Waterhouse exhibited varieties of British Lepidoptera, viz., *Chrysophanus phœas*, *Polyommatus Adonis*, *P. Alexis* and *Agrotis exclamationis*.

Dr. F. Buchanan White forwarded to the Society the following account of a case of "Pruritus from an Unusual Cause," by Dr. Tilbury Fox, extracted from the 'Medical Examiner' of 21st December, 1876 :—

"At the end of July, 1876, a gentleman resident in the Eastern Counties noticed on the eyelid of his infant a small red speck, which on examination with a hand-microscope proved to be a living parasite, partially imbedded in the skin. Several days subsequently his wife was greatly annoyed by pruritus, and her neck and chest were found studded here and there with these little red specks, which at first sight were thought to be "petechiæ," but turned out to be insects. They could be readily extracted with a pin. In the attempt to discover the source whence the parasites came, a pet pug dog was examined, and then collections of these parasites on the nose and between the eyes—where, in fact, the hair was least thick—were discovered. During August the little red visitors caused excessive annoyance to the servants and everyone in the house, defying all remedial measures, though some members of the household were very much less affected than others. Remove them as you would, the next day a fresh supply appeared, and the insects were found on the arms of the infant as well as the face, on the back, neck and chest, and even the nipples of the adults. A favourite long-haired French cat was examined, because one of the family after nursing it was greatly annoyed, and the ears were found infested. The hair fell off, leaving bald patches where the parasites were congregated on the dog and the cat. In the middle of August the animals were shut up, isolated, and regularly dressed with equal parts of sulphurous acid and glycerine, and the plague began to diminish at once. The members of the household had tried citrine ointment, compound sulphur ointment, detergent solution of tar, &c.; but still the nuisance continued in some degree, and a second cat was found affected. But when all the animals were shut out of the house the mischief did not cease. There was some doubt and difference of opinion with regard to the exact species of the parasite. A specimen was submitted to my friend Dr. Cobbold, and he pronounced it to be *Trombidium*, or garden mite,

which lives on plants. It is closely related to the true mites, the itch-insect, the little red "spider" of hot-houses, and the well-known *Leptus autumnalis*, or "harvest-bug." The annoying pruritus about the legs produced by the latter at the end of the summer, after a walk in the fields, &c., is well known to every one; and Dr. Heiberg has lately recorded that the nuisance assumed an epidemic form in a village in Denmark. In the present case the pruritus was chiefly around the neck and shoulders, and several parasites were removed from the eyelids. The plants in the garden were not examined to see if plant-mites were very abundant there, as this exact source was not suspected at the time. There can be little doubt, I think, that the original source must have been certain plants in the garden; that the house pets, who were undoubtedly first affected, were agents in the conveyance of the main portion of the parasites to the human members of the family, but not exclusively, the probability being that many of the people, especially after the pet cats and dog were excluded from the house, managed to be infected directly from the original source."

Papers read.

"Notes on the African *Saturnidae* in the Collection of the Royal Dublin Society." By W. F. Kirby.

"Descriptions of new Genera and Species of Phytophagous Beetles belonging to the Family *Cryptocephalidae*, together with Diagnoses and Remarks on previously described Genera." By Joseph S. Baly, F.L.S.

"Descriptions of new Species of Phytophagous Beetles belonging to the Family *Eumolpidae*, and a Monograph of the Genus *Eumolpus*." By Joseph S. Baly, F.L.S., &c.—F. G.

NOTICES OF NEW BOOKS.

Eastern Persia: An Account of the Journeys of the Persian Boundary Commission, 1870—71—72. Vol. I. The Geography and Narratives, by Majors ST. JOHN, LOVETT, and EUAN SMITH, with an Introduction by Col. Sir F. GOLDSMID, C.B. Vol. II. The Zoology and Geology, by W. T. BLANFORD, F.R.S. With numerous coloured plates. Published by the authority of the Government of India. London: Macmillan & Co. 1876.

THE object of the mission of which these two handsome volumes detail the result was to settle the disputed boundaries on the

eastern frontier of the Persian empire, the disputants being virtually the Shah of Persia on the one hand, and the Amir of Afghánistán (in right of certain acquired interest through rebel feudatories) on the other. By the settlement arrived at through this Commission, Persia got the position which is designated as Sistán Proper, while to Afghánistán was allotted the country on the right bank of the river Helmund, and, above a certain point on that stream, all the cultivated land on both banks.

Owing to numerous delays and difficulties which our diplomacy apparently created rather than averted, the labours of the Commissioners were tediously prolonged during several years, and the first volume of the work before us is occupied with narratives of the various journeys necessitated or undertaken, and an account of the observations and researches made *en route* by the different members of the Staff. It is in fact a kind of Blue Book of the Persian Boundary Commission, and undoubtedly embodies a large amount of valuable information, although of a nature somewhat foreign to the scope of this journal.

The second volume demands a more lengthy notice at our hands. Fortunately for all who are interested in Natural History, there was one amongst the above-named officers, Major O. B. St. John, who was actuated by far higher views than those of an ordinary traveller and sportsman, and, with the aid of a native collector sent from the Indian Museum at Calcutta, he amassed during the years 1869—70—71 no less than 500 specimens of mammals and birds from such hitherto little-known districts as the forests south and west of Shiráz and its vicinity, and also from the hill ranges between Shiráz and Isfahán, from Tehrán and the Elburz mountains, and from the neighbourhood of Resht, near the Caspian. The consequence of this able pioneering was that when a highly trained scientific observer like Mr. Blanford arrived in the country, in 1872, he found the road considerably smoothed for him, from a naturalist's point of view, and indeed the valuable co-operation of Major St. John is most fully acknowledged by him in these pages. These two naturalists then made a journey in company from Gwádor, in Balúchistán, to Shiráz, Isfahán, and Tehrán, and the result of their joint observations and collections, the latter carefully worked out in Europe with the aid of the best public and private museums for comparison and identification, appear in the present volume.

The author's systematic catalogue principally relates to mammals, birds, reptiles, and amphibia, 347 species and 2051 specimens of which were obtained, exclusive of collections of individuals of the two latter groups previously examined and described by Dr. Anderson, of the Indian Museum, Calcutta. Mr. Blanford's scientific descriptions are supplemented by many valuable and interesting remarks by Major St. John, relative to the habits of the various species he observed during his prolonged residence in Persia, an advantage from which Mr. Blanford was necessarily debarred. He modestly states that even the present cannot pretend to be other than a very imperfect list of the fauna of this vast—and to a great extent, unexplored—country, the north-eastern portion of which is still almost a *terra incognita*, whilst there is much to be learned respecting the animals inhabiting the plains extending from the Tigris to the Zagros mountains, the western slopes of which are covered with forest, as are also the southern shores of the Caspian. Prior to the present expedition our knowledge of the Zoology of Persia proper was extremely limited, the explorations of Pallas and Eichwald having been restricted to the shores of the Caspian, whilst those of Gildenstadt were principally confined to the Caucasus, and by far the most important, although still meagre, information was to be derived from the "Noté di un viaggio in Persia" (Milan, 1865), by Professor De Filippi, of Turin, who accompanied an Italian embassy in 1862. In this work a list is given of 30 species of mammals, 167 birds, 39 reptiles, 3 amphibia, and 22 fishes; but the investigations of Major St. John and Mr. Blanford have increased this catalogue to no less than 89 mammals, 384 birds, 92 reptiles, and 9 amphibia! The number of species is not surprising when we consider the great variation in soil, climate, and temperature to be found in a country like Persia, which consists to a great extent of desert plateaux of varying and often considerable elevation, for the most part destitute of vegetation, whilst on the shores of the Caspian is a moist forest region, and a thick belt of woodland also extends from the Zagros mountains to Shiráz; and again towards the Persian Gulf and Indian Ocean the vegetation becomes more tropical, though rarely luxuriant. Mr. Blanford analyses the character of the distinctive fauna of each of the various regions, and sums up that of the Persian highlands as being Palæarctic, with a great prevalence of desert forms, remarking

upon the great difficulty of establishing a desert province, although there can be little doubt as to the existence of a true desert fauna.

Many of the forms of animal life are characteristic of Central Asia, especially the Ounce (*F. uncia*), *Alactaga indica*, a Jerboa hitherto only known from Afghanistan, and *Spermophilus concolor*, amongst mammals; whilst such more widely distributed forms as *Felis pardus*, *F. chaus*, *Ovis cycloceros*, *Capra ægagrus*, &c., are also to be found, along with species restricted to Persia, representative forms of well-known families. Such are the new species of Hedgehog, *Erinaceus macracanthus*, *Vulpes persicus*, *Meles canescens*, *Gerbillus persicus*, and *Gazella subgutturosa*, whilst under still closer restrictions as regards range we find three species of Bats, a Jerboa, and *Lagomys rufescens*, a Nuthatch (*Sitta rupicola*), and ten species of reptiles. The fauna of the forest district along the south-east coast of the Caspian is extremely interesting, for, although on the whole Palæarctic, there are several species apparently peculiar to the locality, and also several Eastern forms unknown in other parts of Persia, such as the Tiger, *Cervus Caspius* (a Deer allied to *C. axis*, belonging to the Indo-Malayan group), and a Viper (*Halys Pallasii*). The existence of the Tiger in the Caspian provinces north of the Elburz range, corresponding in part to the ancient Hyrcania, was well known to ancient writers, and allusion to Hyrcanian and Caucasian Tigers must be familiar to all readers of Virgil; but the fact of a Deer of Indo-Malayan affinities being found in the same district as *Cervus morral*, the only true Elaphine Deer which is found in Persia, is very remarkable, and an important addition to our knowledge of geographical distribution. The birds of this district call for little remark, as the author's new species, *Erythacus hyrcanus*, is confessedly only a local and brilliant form of the common Robin, and *Garrulus hyrcanus* is one of those local forms of the Jay which drive the systematist to despair, with the alternative of "lumping" nearly all the races together, or of making as many species as there are varieties. With regard to the wooded slopes of the Zagros, and the oak forest as far as Shiráz, the fauna, so far as known from Major St. John's collections, appears to be mainly Palæarctic, although one of the characteristic mammals is the Lion, which is found in Mesopotamia. It does not appear to exist on the table-land of Persia, nor in Balúchistán, and, so far as can be judged

from the limited knowledge we possess, it rather resembles the form inhabiting North-East Africa than the Guzerat animal. Major St. John's notes upon this species are extremely interesting, and the narrative of his adventure with a lioness is of far more thrilling interest than half the stories put together with which we are familiar. Indeed of late nothing less than four or five lions bolting from cover altogether at a "hot corner," and being rolled over (on paper) like rabbits, will suit the modern appetites for large bags, and it is refreshing to meet with a lioness that could look an Englishman in the face without dying on the spot.

This district produced a new species of Woodpecker (*Picus Sancti-Johannis*), closely allied to the European *P. medius*, and two new Titmice—one *Parus phœnotus*, allied to *P. ater*, but distinguishable by its olive-brown back; the other *P. persicus*, a pale-coloured form of *P. cæruleus*.

Of the fauna of Mesopotamia Mr. Blanford's regard for accuracy precludes him from saying much, as available information on the subject proved very scanty, but his remarks on the Zoology of the shores of the Persian Gulf and Balúchistán are of great interest, as he has personally explored this region, the fauna of which differs widely from that of the rest of Persia. The Palæarctic forms are now almost entirely replaced on the highlands by desert species of the Indian fauna, and in a few cases by Malayan types, whilst several others are African, and are either unknown in India or at most do not extend beyond Sind and the neighbouring districts east of the Indus, all of these last being desert types.

Space will not permit us to pick out the new and interesting species which he has described, nor would it be fair to the author to do so. Many of the mammals and birds are illustrated by beautiful coloured plates by Keulemans, as well as by woodcuts and by lithographic engravings of the reptiles by Ford, and an excellent coloured map is given of the geographical provinces. On the whole the volume is an indispensable one to naturalists, and is in every way worthy of Mr. Blanford's high reputation.

THE ZOOLOGIST.

THIRD SERIES.

VOL. I.]

APRIL, 1877.

[No. 4.

ANCIENT AND EXTINCT BRITISH QUADRUPEDS.*

By A. LEITH ADAMS, M.D., F.R.S.

ANY account of the quadrupeds which frequented the British Islands in bygone ages and before historic times would be imperfect without a brief allusion to the physical conditions of the country during the period of their existence. My observations on that head, however, will be confined to the vast epoch which has elapsed since the close of what is known as the glacial period, when Europe was emerging from the white sheet which for unreckoned ages had clad it, from the Pole to the Mediterranean, in ice and snow. The proofs of this curious episode in the history of the earth are as clear as is the existence of glaciers at the present day. It is, moreover, evident, that the cold period came on suddenly, and, as regards the British Islands, at a time when the physical aspect of the country—at least, as regards the main features of the landscape—did not materially differ from what is now observed. The land was then inhabited by quadrupeds, some of which were identical with species now living, although many afterwards became extinct, and did not reappear. This has been named the pre-glacial period, when our climate was perhaps somewhat milder than it is at

* This article on a subject of much interest to zoologists, and upon which comparatively little has been written, was originally published in the Natural-History columns of 'The Field,' and appeared in chapters during the months of October, November and December, 1875, and January, 1876. It is now reprinted for the benefit of such of our readers as may not have seen it, and for the convenience of those who, having already perused the scattered chapters as they first appeared, may be glad to see them now collected in the more convenient and portable form of an octavo.—ED.

present. During the subsequent glacial epoch the whole of the British islands, including portions since submerged, were clothed in an eternal winter mantle, partly snow and partly in the form of glaciers, which moved down from the high to the low lands, carrying with them rocks and *débris* of all kinds to form fresh deposits.

The remains of the animals in question have been preserved chiefly in caves or in river deposits. The limestone caverns, in which they are found, usually present the following appearances:—On the floor there is a bed of calcareous drippings hardened into a substance known as stalagmite. Under the latter may be seen successive layers of clay and stalagmite of various thickness. Sometimes the osseous remains are found on the floor of the rock simply embedded in the stalagmite. The various levels formed by an alternation of cave-earth or clay and drippings may represent various stages in the history of a cave. For instance, on the surface flint tools, fashioned by man, together with bones of the Red Deer and Oxen, may be found; in the second layer may be discovered the remains of herbivorous quadrupeds and of Lions and Elephants, the larger bones showing evident traces of having been gnawed by predaceous animals. Under these conditions, it may be surmised that the cave was originally a den of carnivorous animals, which had dragged in the bones of their prey, until the surface, getting gradually covered over by stalagmitic drippings, became eventually the resort of man. Of course the absence of traces of his presence is no proof that he may not have been contemporary with the lions in the second deposit; at the same time, we are not justified in admitting his presence unless we find the bones of domestic animals, flint tools, or other relics of man mingled in the same stratum. As to the age of these two deposits, they may or may not represent long periods; much depends on the rapidity or otherwise of the influx of the cave-earth, either through rock-fissures or by the aid of streams, which convey large quantities of soil into underground caverns; whilst the extent of dripping of the lime-water from the roof and sides, and its hardening, depend entirely on circumstances; for a cave may get filled to the top in a comparatively short time, or its filling may be the work of ages. In either case some covering of the bones must take place before they have time to decay, as they otherwise would do if left uncovered. It is wonderful how little stalagmite is required to preserve a bone; a mere crust, not

the thickness of a shilling, will often suffice to preserve the thigh-bone of an Elephant. It is now generally supposed that many of the rivers of our southern and eastern coasts are but the head-waters of what were once much larger rivers before the severance of the islands from the mainland of Europe. The Thames is thought to have been one of the tributaries of the Rhine; and, as will be noticed in the sequel, it is seldom that oyster-dredging is prosecuted with vigour on the coasts of Norfolk and Suffolk without quantities of bones of extinct quadrupeds being brought to the surface. When the separation in question took place is not altogether clear; that England and Europe were united, however, at the close of the glacial epoch seems pretty certain, else how could such animals as the Elephant and the Lion have reached the British Islands? The probability is that there was a highway at the Straits of Dover, which may have disappeared before the Lions and Elephants died out on British soil.

With the thaw of the glacial period the rivers doubtless became, then and long afterwards, subject to constant inundations, which covered large tracts of country, and formed deposits of sand, loam and clay, in which the animal remains are now found. London, for example, is built on deposits of the ancient Thames; and in many other situations where insignificant streams now exist, the banks are made up of vast beds of *débris* stretching inland, and containing the bones of both extinct and living animals. Again, deep in the brick-earths of the Thames Valley, at Clacton, Ilford, Grays (Essex), and Crayford, remains representing herds of giant Oxen, Deer, Elephants, Rhinoceroses, &c., have been discovered from time to time, indicating that they had probably been drowned and carried down by inundations of the Thames. In the nature of the animal remains there is a general accord with those of river-bottoms and of the caves, thus showing that they were of the same geological period. But in the brick-earths, or lowermost strata of rivers, it sometimes happens that remains of animals are found distinct from any other species found in the upper beds and in the caves; in consequence, it has been surmised that the brick-earths may have been deposited during pre-glacial times, and therefore contain the animals of that epoch. Some idea of the animals which frequented Wales, South and South-Western England, the Thames Valley, Yorkshire, and the South of Ireland may be gathered from the following:—

In several caverns in Glamorganshire remains of man have been

found, associated with bones of the Rhinoceros, Spotted Hyæna, Badger, Ermine (or Stoat), Polecat, Wolf, Fox, Otter, Grisly Bear, Brown Bear and Great Cave Bear, Reindeer, Roebuck, Red Deer, Bison, Urus (or Giant Ox), Hippopotamus, Pig, Horse, two species of Elephants, Hare, Rabbit, Water Rat, Cat, Lion, and Great-horned Deer. In the Devonshire caves the same animals, with the addition of the Sabre-toothed Lion and the Lemming. In the brick-earths and deposits of the Thames an exact repetition of the first have been found, with the addition of the Beaver. The celebrated cavern of Kirkdale was a den of Hyænas, where nearly all the animals of the other caves were found, thus showing a very general distribution throughout the country. The only Irish cave or river deposit at all fruitful was the cavern of Shandon, in the county of Waterford, where remains of the Mammoth, Elephant, Horse, Reindeer, Red Deer, Grisly Bear, Wolf, Fox and Hare were found associated. Scotland, not possessing many limestone caverns, and the Highlands being of granitic formations, together possibly with the effects of a rigorous climate during the period when the quadrupeds in question were living in England, may account for the absence of remains of any save the Wolf, Mammoth and Reindeer, although others may remain to be discovered.

I now propose to note a few of the more interesting details which geologists have brought to light concerning the various species of animals which formerly inhabited the British Islands, but which are now either extinct or only exist in a few localities and in greatly diminished numbers.

THE BROWN BEAR is one of the few extinct British beasts which survived up to the historical period, and, although it had disappeared probably for centuries beforehand in England, we have it on excellent authority that it was common on the Scotch Highlands as late as the middle of the eleventh century.* The date of its existence in Ireland is not recorded;† indeed, as will be presently shown, there are doubts if the Brown Bear (*Ursus arctos*)

* Pennant says it was a native of Scotland in 1057.

† No tradition has yet been found with reference to its Irish residence, although the name *math-gamhuin* (calf of the plains) is supposed by many authorities to refer to the Bear. St. Donatus, who died A.D. 840, asserts it was not in the island in his time.—*A. L. A.* [The skulls of Bears referred to by Dr. Ball (*Trans. Roy. Irish Acad.*, 1819) as having been found in Ireland, are now considered to have belonged to the Grisly Bear.—*Ed.*]

was a native of that island. It was, however, generally distributed over Central and Northern Europe, and it still lingers on the Eastern Alps and in Russia, and is spread over Northern Asia, and probably also the boreal regions of North America. In the colour of the fur, and also in size, in different countries it is subject to considerable variation, so that naturalists considered the individuals from Norway, Syria, the Himalayas, and Siberia as so many distinct species. If the mere external coloration, however, and a few other minor points be disregarded, it will be found that the bony skeletons of all agree in characters which, as compared with other bears, at once place them in the same category with the typical Brown Bear (*U. arctos*). In regard to size, the skulls and bones dug up in the fens, peat-bogs, and superficial deposits in England certainly belonged to large individuals, but not larger than many now inhabiting different parts of Europe and Asia.

Not only does historical evidence, accompanied by the discovery of its bones in peat and alluvium, point to the existence of the Brown Bear in unrecorded times, but we find its bones, associated with those of at all events very much larger species, in the caverns and deep soils of England; moreover, seeing that the remains in either case represent very old individuals, and that the teeth and bones differ in many respects, there is good cause to believe in the former existence in Great Britain of at least two species of Bear.

The Great Bear of the caverns and the Brown Bear were therefore contemporaneous. As to the former, on arranging and comparing exuviae collected in Great Britain and on the Continent with bones of living species, it has been found that they admit of division into three, or at least two, distinct forms. One agrees with the skeleton of the Grisly Bear, now chiefly found in the Rocky Mountains and western prairies; the other (*Ursus spelæus*) and perhaps a third (*U. priscus*) have no living representatives, and may therefore be considered as having become extinct in Great Britain long before the historical period. But the Grisly Bear, as far as is known, seems to have disappeared likewise about the same time.

The *Ursus priscus* was the giant of all. Although not rare in England, it appears to have been very common in Southern France and in the Pyrenees, judging from the quantities of bones discovered in the caves and soils. It would appear that, irrespective

of larger dimensions, this Great Cave Bear was distinct from the Grisly, or else an unusual variation in regard to bulk and certain osteological characters obtained in the Grisly Bear of ancient Britain. Compared individually, the Brown, Grisly and Cave Bears stood in much the same relative height as the Shetland pony, Galloway, and dray horse.

The geographical distribution of these bears over the British Isles, so far as is known, seems to indicate that the largest form was restricted to England, and that the Grisly was also common in Ireland, where no certain remains of the Brown Bear have been yet discovered.

The Cave Bear no doubt was the first to disappear, followed by the Grisly, whilst the Brown Bear survived to within historical times. All were contemporaneous here long after the separation of Great Britain from the Continent, and gradually died off, it may be from failure of food or through human agency. Looking to the habits and food of living species, it is apparent that the Bear would survive the Lion, for the reason that it is not entirely dependent on flesh for its subsistence, but will eat vegetable food—indeed, many species prefer it to animal food; consequently the Lion may have died of starvation in Great Britain when the Deer and other prey became very scarce.* No doubt failure of food has brought about the extinction of many species, and in the case of the British Islands, even supposing man had not appeared on the scene, the severance from the Continent must have initiated a struggle for existence among the larger quadrupeds, of which the fittest only would survive. The great Cave Bear and the Grisly, not to mention the Lion and Hyæna, must have been formidable enemies to the deer and wild oxen; indeed, the probabilities are that none of the former survived long after the separation from the mainland.

That man played a considerable part in exterminating the bear tribe is proved by the arrows, spears, and hatchets of stone which have been discovered in several caverns† either overlying the remains in question or associated with them. But, although man contributed to the extinction of many species, it is probable that

* But the wild deer have outlived the lion, and survive to the present day. The wild ox was more probably the lion's prey.—ED.

+ Amongst others may be mentioned Kent's Cavern; Brixham Cave, Devonshire; Long Cave, near Gower; and Wokey Hole, Cheddar, Somersetshire.—ED.

these wild beasts enjoyed a long freedom before he appeared on the scene. How the thick hides were pierced by arrow- or spear-points made of stone, and how man with such weapons could have held his own against powerful and ferocious bears and lions, seems a mystery when we think of the ferocity of the degenerate descendants of these animals. It is, moreover, a curious circumstance not easily explained that, whilst the tiger and lion are daily destroying human beings, we find no indications of man among the gnawed bones so plentifully distributed throughout the ancient caverns and dens of the post-glacial epoch. The only explanation would seem to be that the larger carnivorous quadrupeds found ample subsistence among the lower animals during the cave period without preying on the lords of creation.

THE GLUTTON, now a native of the Arctic Regions of the Old and New Worlds, was contemporary with the Bears, and sought its fortunes on British soil. Its bones have been discovered in caverns and deep soils in England, but the date of its extinction is so far shrouded in obscurity.

THE BADGER is the sole remaining representative of the Bear family which still lingers in our islands. Like the Glutton, it existed with the Bears, but was not so plentiful, if we may judge from the few bones which have hitherto been discovered.

THE ERMINE, POLECAT, BEECH MARTEN and OTTER can be traced back to the days when the large carnivores and elephantine quadrupeds lived in our islands; and it would appear that, in point of size, individuals of the ancient race did not greatly surpass their modern representatives. It seems probable, moreover, that in all cases where quadrupeds, from early epochs, have remained unchanged in point of size, although confined within narrower geographical limits, they have continued to enjoy abundance of their natural food. At the same time it is the fact that several animals, as the Bear and Elephant, present to a greater extent individual variations in size, according to the favourable or inimical conditions under which they have happened to be placed. These are points of great importance to the naturalist, especially when attempting to trace back the history of extinct animals by a comparison of their remains with those of living species.

THE BRITISH LION is no myth. Two species of the genus *Leo* existed in England long after the glacial epoch. In one of these the canine teeth, so conspicuous in dogs and cats, were enormously developed; and their sharpness and curved form has suggested for the animal the name by which it is known, the Sabre-toothed Lion. Strange to say, the only portions of its anatomy hitherto discovered in this country (in Kent's Cavern) have been some of these very teeth; but on the European continent, as well as in the Himalayas, skulls have been found, as well as canine teeth, the latter varying in length from six to eight inches. If we may judge of the proportions of this beast from the size of its teeth, it must indeed have been a monster. It was a contemporary of the extinct bears and larger herbivorous quadrupeds, but could never have been numerous. Indeed, had it been as common as the existing African and Asiatic Lion is in many inhabited parts of these continents at the present day, neither primæval nor savage man could have held his ground against it. The other species of British Lion was both taller and stouter and had broader paws than its modern representative, otherwise the latter would be regarded as a degenerate descendant of the older race.

There is no sufficient reason for believing that such animals as the Lion, Elephant, or Rhinoceros did not frequent cold regions. The short-haired Tiger of Bengal is replaced by a woolly-haired Tiger in northern China; and in the frozen soil of Siberia discoveries of entire carcases of Elephants and Rhinoceroses clad in dense fur coats prove the exception to the general rule with reference to the outer covering of their living representatives. The fossil Lion, like the large fossil Bear and *Hyæna*, was long considered to be distinct from any living species, but recent discoveries and comparisons have indicated the closest relationship between the living and the dead. Vestiges of the Lion have been discovered in nearly twenty British caverns, as well as in the deposits of rivers; associated in the former case with remains of Bears, Elephants, Rhinoceroses and other herbivorous animals, as well as with *Hyænas*. In fact, the Lion was one of the earliest sojourners in the land after the glacial period had commenced to decline.

A LEOPARD OR PANTHER, apparently not larger than existing species, also roamed over England in company with the preceding.

If its numbers can be at all estimated from the remains which have been discovered in caverns and river deposits, it is clear that this feline animal was not common; the likelihood may have been that it had no chance with its more formidable rivals just mentioned, who monopolised more or less their common prey.

THE LYNX, which is still resident in many parts of the Continent, was also a native of pre-historic England, but hitherto its remains have only been discovered in a single locality.

THE WILD CAT, although now very local in its distribution, still lingers on the scene where its progenitors lived with the Lion, Bear, Wolf, and other carnivorous animals. On comparing the skeleton of the ancient British Wild Cat with that of a recent individual, no difference is observable, for the reason probably that birds and rabbits, its natural prey, have abundantly supplied its necessities; it has, however, been gradually destroyed, or driven back to a few remaining strongholds, by civilized man.

THE HYÆNA, which frequented Great Britain in pre-historic times, and contemporaneously with the extinct bears, was of larger dimensions than any species now living, although it is now generally regarded as the progenitor of the Spotted Hyæna.

THE SPOTTED HYÆNA, as we may call it, was at one time very common in England, but does not seem to have existed either in Ireland or the Highlands of Scotland. A graphic description of one of its numerous dens is given by Dr. Buckland,* who, in referring to the contents of Kirkdale Cave, Yorkshire, likens the floor to a dog-kennel, where gnawed fragments of the bones of Elephants, Rhinoceroses, Bears, Lions, and herbivorous quadrupeds were strewn about among the remains of no less than three hundred Hyænas, the droppings (coprolites) of which were also met with in profusion. This ancient den must have been used by them for a very long period, and, considering that the remains of no less than twenty different species of animals were discovered there, it may be surmised that, at all events, there was a great variety of quadrupeds in the woods and wolds of Yorkshire in those days. Although the Hyæna does not refuse flesh in a fresh state, it prefers a putrid carcase; and its powerful jaws and strong

* Bridgewater Treatise.

conical teeth, surrounded at the base of the crown by a belt of enamel, are eminently adapted for crunching bones, for which it has a predilection. It is a sneaking and cowardly animal, and on any show of resistance by its intended victim will hesitate and even retire. Remains of the Spotted Hyæna have been found in upwards of thirty different caverns in England, and generally in such abundance, as compared with other bones, as to show that it was plentifully distributed over the low lands and forests of ancient Britain. The reason for its absence from Ireland, as before noticed, is not clear; unless, perhaps, there was no direct highway between the two islands, as there was between England and the European continent. Moreover, it may be that the country was not sufficiently inviting, although large game, such as the Reindeer and the so-called Irish Elk, abounded. At all events, not a trace of the Hyæna has as yet been found in Ireland, and there are no authentic accounts of any such remains from Scotland, which, as far as the northern parts were concerned, was then doubtless more or less clad in snow and ice. Again, the habits of the Spotted Hyæna, as now known, show that it is not a beast of the mountains, but of the plains.

All the quadrupeds which have lingered on in Great Britain to within historical times were evidently sooner exterminated in England than elsewhere. THE WOLF furnishes an instance. It was quite a scourge in various parts of Ireland and Scotland during the seventeenth century, especially in the former country, where a breed of wolf dogs was carefully preserved.* This race of dogs is now also extinct. It resembled the Scotch Deerhound, but the skull was more wolf-like, so that there is now some difficulty in distinguishing the one from the other. Traces of old circular entrenchments, into which cattle, sheep, and goats were driven for protection from wolves, are still met with in abundance in many parts of Ireland, especially in the southern counties. Unlike other extinct British beasts, the Wolf apparently has not deteriorated in size, for the fossil bones which have been discovered are not larger, nor in any way to be distinguished from those of European Wolves of the present day.

* The last Wolf killed in Ireland was in county Kerry, in A.D. 1710. It was common in Connaught, according to O'Flaherty, in 1700. In 1641 and 1652 Wolves were very troublesome, and a council order by Cromwell, dated at Kilkenny, prohibits the exportation of wolf dogs.—*A. L. A.*

When Hyænas and Lions roamed over England, the Wolf was apparently the only large carnivore in Ireland. From this circumstance it has been argued that Ireland was detached from Europe before England and Scotland; or, what may have been more likely, that the physical conditions of the former were not suited to the habits of the animal. Indeed, the apparent anomaly might be explained by comparisons with recent species. Thus, the Brown Wolf, although met with along the lowland valleys of the European and the Asiatic Alps, is not found on the high mountains; and on various parts of the Himalayas Bears, Deer, Ibex, &c., may abound on one range and not on the adjoining one, although apparently equally inviting. To the naturalist who traces back the history of animals into the unrecorded past it is important to know the habits and haunts of living species, and especially their general and particular distribution, inasmuch as the finding of fossil remains in abundance in one situation, and the absence of such remains in another, might lead to the belief that the localities represent two different stages in the earth's history. Moreover, many wild animals repel other species from their haunts. It is said that few of the large quadrupeds frequent districts resorted to by the African Elephant, in consequence of his nocturnal habits and the disturbance he creates in his wanderings; and the Ibex and Great-horned Goat of the Himalayas monopolise whole ranges, and maintain the sovereignty against all other ruminants.

The Wolf must have fed sumptuously in Ireland among the herds of Reindeer and the Great-horned Deer which abounded in that country, seeing that it had no rival, such as the Lion, Panther, or Hyæna, to dispute its rights; indeed, naturalists have surmised that the finding of the skeletons of herds of the latter in the mud of ancient lakes in Ireland indicates that the animals had been driven into the mire by packs of Wolves. We can well imagine the enactment of such a scene as the "Race for Life," so artistically pourtrayed in Mr. Joseph Wolf's 'Wild Animals,' on many a tarn of ancient Ireland, before the formation of the peat.

THE ARCTIC FOX has been but lately added to the ancient British fauna, whilst the Common Fox, as one of a few privileged species, has contrived to maintain its footing in the country to the present day.

THE DEER tribe was represented in our islands from the glacial period up to recent times by the gigantic animal known as the Irish Elk, which, with the Moose or Elk, and Reindeer, disappeared from this country before the historical epoch, whilst their contemporaries, the Red Deer and Roe, have, through careful protection, survived them.

THE GREAT-HORNED, or GIGANTIC DEER, was unquestionably one of the most magnificent quadrupeds that ever trod the face of our planet. A full-grown stag, standing erect, measured from ten feet to twelve feet from the ground to the summit of the antlers, the spread of which covered over ten feet; with such a span, it has often been a matter of wonder how the animal could proceed through the forest, unless, as the Red Deer often does, it constantly dipped the antlers, which in case of pursuit would greatly impede its progress. Hence the supposition is that it fed more in the open, along the bare hill-sides and by the margins of lakes. The first entire skeleton was discovered in the Isle of Man about 1825; subsequently larger and more perfect skeletons were found in Ireland, and, almost without exception, in the shell marl and clay underlying the bogs. We believe we are correct in stating that no remains of the Great-horned Deer have yet been found in the peat, which shows that the animal must have died out before the moss and other water plants commenced to form on the lakes. Notwithstanding the discovery of several thousand heads and bones of this Deer, they afford no indication that man was contemporary with it, and old Irish literature has been ransacked in vain for evidence on this point.

It was, however, contemporary with the Reindeer in England and Ireland, where remains of the two have been found associated, whether through chance or choice; and there is no doubt that the animal was at one time extremely common in the sister isle—so plentiful, indeed, that there are few peat bogs which have not produced exuviae.

During the summer of 1875 no less than thirty skeletons huddled together were exhumed from underlying clay in the bog of Killegar, among the Dublin mountains, whilst in the same situation (both instances occurring in an area of not a hundred yards by twenty) in 1847 as many as thirty more heads of this Stag were found. However the deer perished—whether by getting mired when

crossing the lake, or when feeding along the margin, or on being driven there by wolves—it is clear that entire herds were destroyed at the same time. The above is only one of many such instances. Amongst the heads found at Killegar in 1847 were two with interlocked antlers. Another and similar instance is recorded from a bog near Limerick,* so that it would seem that many deer lost their lives in mortal encounter along the sides of lakes.

The objection to this deer being called an Elk is the obvious dissimilarity in the form of the antler in the true Elk and so-called Irish Elk. The former had neither brow nor bez antler†; for a long time they were confounded, although, when the difference is pointed out, a glance is sufficient to distinguish them. The weight of the heaviest skull and horns of the Elk seldom exceeds 55 lbs., and the extreme breadth across the latter is about 70 inches; whereas many dried specimens of its Irish congener weigh upwards of 90 lbs., and give a horizontal measurement of antlers of as much as 120 inches. The great ugly skull and short neck of the Elk, allowing the antlers to be easily thrown back on the withers, contrast with the small handsome head and long serpentine but powerful neck of the Great-horned Deer. The delicately formed limbs of the latter are unlike the large-boned extremities of the former; in fact, the entire aspect of the latter shows a rare combination of great strength and agility, not equalled in any living species of the family. Although no remains of this deer have been found in conjunction with those of other wild denizens of Ireland, excepting the Reindeer, the probability is that, like the latter, it was a contemporary of the Bear, Horse, and Mammoth. Its remains have turned up in about twelve different English caverns, and in various river deposits, associated in several instances with bones of the large Carnivora and other extinct quadrupeds, showing that it had a place in the ancient British fauna at an early period. Nowhere, however, does it seem to have been so plentiful as in Ireland. This has been accounted for, as before observed, by the paucity of carnivorous quadrupeds, and of

* Oldham, Journal Geological Society of Ireland, vol. iii., p. 252.

† Several attempts at imposition have been practised in Ireland by importing horns of the Moose, and painting them red to give a semblance of antiquity. The head of the male Gigantic Deer is in great request among dealers, and in a recent instance as much as £25 was given for a skull and horns of by no means a large individual.—A. L. A.

such blood-thirsty enemies as the Lion, the Hyæna, and the Bear. In all probability the sharp-pointed antlers ably resisted the attacks of the packs of Wolves which doubtless hung on the flanks and rear of the herd to pull down the young and weakly.

A few years ago, under a bog in county Longford, several bones of the Giant Deer were discovered, in which were deep incisions, as if made by man; indeed, had there not been a ready explanation to the contrary, the appearances were almost conclusive in regard to the artificial nature of the indentations, which resembled the clean cuts made by an axe or hunting-knife. On the shaft of a thigh-bone, close beside it, and fitting into the incision, was the sharp, angular side of the shaft of a tibia, or leg-bone, of the same animal. The quaking or constant up-and-down movement of the mud of the bog for ages, under the successive influences of heat and cold, had caused the tibia to cut deeply into the thigh-bone, and so imitate the appearance of a clean incision by some sharp-edged implement. But, although there are no records of the contemporaneous existence of this Deer and man in Ireland, there are caverns, such as Brixham, Kent's Cavern, and Wokey Hole in Somersetshire, where stone implements of man have been found in proximity with its remains. Many of its bones found in Irish bogs contain marrow, and blaze freely when burned. The small value put on them in times past may be gathered from the fact that the intelligence of the Battle of Waterloo was celebrated in a village in county Antrim by a bonfire of the bones of this animal, while its great horns were often used to form garden fences.

The freshness of the remains, allowing for the excellent preserving influence of the marl, would seem to indicate that the decease of the Giant Deer is of more recent date than that of many of its congeners, and yet, so far as Ireland is concerned, man does not seem to have contributed in any way towards its extermination.

The former existence of the ELK or MOOSE in the forests of ancient Britain has been inferred from several discoveries. On one occasion portions of its remains were found in the cave of Llandebie, in Wales, in proximity with remains of the Brown Bear. It is not probable, however, that the Elk was very plentiful in this country, although still not uncommon in Norway, and generally distributed over Canada; it is evident that no deer

could have sojourned for ages in a country without leaving behind them traces of their former existence, not only in their cast antlers, but on account of the fact that they were much more numerous than the Carnivora which prey upon them.

The FALLOW DEER, a native of Southern Europe, and still met with in several islands of the Mediterranean and elsewhere, has, on the discovery of a single horn in the mud of the Thames at Clacton, been supposed to have inhabited Great Britain in the days of the elephants, bears, and other animals of the post-glacial period.*

THE REINDEER was one of the earliest arrivals on British soil after the ice and snow of the glacial epoch began to disappear. It must have been very common in England and Ireland, and perhaps also in Scotland—at all events, after the great glaciers began to recede. Remains of the animal have been discovered in thirty caverns and in as many river deposits throughout England, and in Irish caverns, and in shell marl under Irish bogs and Scottish lakes.† It is still plentifully distributed over the boreal regions of Europe, Asia, and America, but varies considerably in dimensions, and somewhat in the appearance of the antlers, in different countries; indeed, as regards height and weight, there are remarkable peculiarities in different regions. Thus the Reindeer of Lapland is small, as compared with the Siberian and Newfoundland forms; the former stands about three feet five inches, whilst the latter is on an average four feet two inches at the withers, their weights respectively being often 90 lbs. and 300 lbs. There is no evidence to show when the Reindeer disappeared from the British Isles, but it was contemporary with the Lion, Hyæna, and Elephant, and lingered on until the advent of man, whose flint tools have been discovered in the same deposits which contain its bones. The fossil remains, as compared with the bones of recent varieties, such as the Caribou or Great Woodland Reindeer of Canada and the smaller forms of Northern Europe, approach, in the rounded beam and large brow antler and dimensions of bones, to the Norwegian and Lapland Reindeers, which are probably direct descendants of the old British stock; so that the

* *Vide supra* p. 92.

† As many as 1000 antlers are said to have been taken from a rock fissure in South Wales. Falconer, *Palaeontological Memoirs*, vol. ii., p. 510.

ancient Reindeer of Great Britain was not relatively so large as many individuals now living. The bones found in English caverns, and that of Shandon, in Ireland,* were fragmentary, and had evidently been dragged there by predaceous animals. There are, however, two splendid heads, almost entire, from the bog marls now in the museum of the Royal Dublin Society, one of which has been already referred to in connection with the discovery of the skulls and bones of the Giant Deer; the other, and more perfect of the two, is from a neighbouring locality among the Dublin mountains.

As known to us at the present time, the Reindeer is associated with an Arctic climate. It is, however, still not uncommon in North America as far south as New Brunswick, and was even common lately in the forests of New England, latitude 40°. But doubtless the climate of our islands in former days was much colder than at present; indeed, the same may be said of Central Europe, inasmuch as Reindeer remains have been found in the caverns of the South of France.

There are no ruminating animals more given to extensive migration than many varieties of the living Reindeers of North America and Asia, so that their northern and southern limits frequently include many degrees of latitude. They are easily hunted down, and consequently soon exterminated from particular tracts.

THE RED DEER, like the Roe-buck, the Mole, and the Water Rat, is one of the few survivors of the extensive list of mammals which inhabited Great Britain during the Pliocene epoch—*i.e.* the epoch which immediately preceded the glacial period. Their pedigrees, therefore, are as ancient as any in the land—at all events, so far as the discovery of fossil relics is concerned; but in all probability neither of the two first-named would have survived but for the protective influence of man.

Remains of the Red Deer are met with in peat and superficial soils; in clay and marl below the latter; in more ancient cavern deposits, associated with relics of nearly all the extinct and several living species, as well as in estuaries and river deposits, said to have been formed before the glacial epoch. The bones and horns

* Shandon Cave, near Dungarvan, Co. Waterford, where bones of upwards of fifty individuals have been found associated with those of the Wild Horse, Mammoth, Red Deer, Wolf, Bear, and Fox.—ED.

of the more ancient individuals are, on an average, larger than our semi-domesticated races. Indeed, the denizens of Great Britain are inferior in size and development of horn to those of Northern and Central Europe; whilst the Red Deer of Siberia and the Himalayas are even larger still, and approach more nearly the largest fossil forms, and to the great Wapiti of Canada: so that, considering the antiquity and wide-spread distribution of the Red Deer, and the varying climates in which it exists, one might almost refer them all to one species, certain varieties of which have become differentiated under the influence of food, climate, and situation. Horns of the Red Deer from the same deposits in Ireland as those of the Gigantic-horned Deer are not so massive as those of the same age from many localities in England and Scotland.

THE ROEBUCK does not appear to have been a native of Ireland, according to the historian Giraldus Cambrensis, who seems to have been well acquainted with the beasts found in England in his day (1180), and at all events made inquiries in Ireland with reference to the wild animals of that country; but when its condition at that period is considered, the probability is that its fauna was comparatively unknown.

THE MUSK Ox, or MUSK SHEEP, as it is variously named, now confined to the Arctic Regions, was once a native of England, as testified by the discovery of its remains in eight or ten different localities, either in caverns or river deposits, associated here and there with remains of the Hairy Mammoth and the Hairy Rhinoceros.

The ancient British oxen were of two species, a Giant Ox and a Bison.

THE PRIMÆVAL or GIANT Ox was a noble animal; but both species were gigantic in size, and were doubtless formidable antagonists to even the lions of the period. The Bison seems to have been prevalent in Great Britain during and long after the Roman invasion, whilst, on the other hand, there are evidences to imply that the one under consideration lived in the land before the glacial period.

The Primæval Ox's remains are met with in ancient tumuli, but perhaps it was exterminated before Cæsar's landing.*

* Cæsar mentions this animal, "Urus," as plentiful in the Hercynian forests, but does not refer to its presence in Britain.—ED.

In the brick earths of the Thames valley magnificent heads of this noble-looking animal have been discovered from time to time. Even the horn cores in many instances measure three feet, with a breadth of forehead between horns of one foot. Although abundant remains have turned up in England, Wales, and Scotland, there are no authentic data of the animal in connection with Ireland. Whether the semi-feral Chillingham breed belongs or not to this species, it is evident that it is, as regards size, a degenerate race of either of the British fossil oxen. As to the assertion that our domesticated cattle are descended from the Giant Ox, it may be stated that, unless introduced by the Romans, there is a probability that the Long-fronted Ox, which will be noticed presently, may have sprung from the latter, and in the course of ages become through domestication a distinct variety, from which all our modern cattle have been derived; but the foreign wild species are so numerous, that to speculate on domesticated breeds and their progenitors would be a fruitless undertaking. With reference to our islands, and Europe generally, it was believed by Cuvier—and Bell in his 'British Quadrupeds' is of the same opinion—that our domestic cattle are the degenerate descendants of the Wild Ox, whilst Professor Owen is more inclined to think that the Romans were the first to introduce cattle into England. The discovery, however, of remains of the Long-fronted Ox in various parts of the country, associated with stone and bronze implements considered pre-Roman, gives strength to the view that it was reclaimed by the ancient Britons long before the invasion. It seems, however, now impossible to differentiate all the points in connection between the wild and tame oxen, so as to come to just conclusions as to their relationships; indeed, as far as pedigree is concerned, the British human and bovine animal are on a par.

THE BISON or AUROCHS seems, if anything, to have been more plentiful than the Giant Ox. It was larger than the living Bisons of Europe and America, but the connections between the three are very close, and, when we admit time as a factor, in conjunction with food, region, and climate, it may be fairly allowed that the present denizens of the Lithuanian, Moldavian, Wallachian, and Caucasian forests and North-western America are very closely allied to each other, and to the fossil remains found in Great

Britain and on the Continent.* The finest bulls of the Lithuanian breed stand about five feet six inches at the withers, whilst, according to Richardson, the American Bison is upwards of six feet in height. The fossil British Aurochs, as compared with these, must have frequently reached a height of seven feet at the shoulder. The Grisly Bear is at present one of the most formidable enemies to the American Aurochs, as doubtless was also the case in bygone times on British soil.

THE LONG-FRONTED or SMALL FOSSIL Ox is considered by Prof. Owen to be an ancient and distinct species which sojourned with the other oxen, bears, elephants, and like extinct quadrupeds. It seems to have been very plentiful in Ireland, and survived at all events up to the human, and most likely the historical, period, in which cattle are frequently noticed in old Irish MSS.,† but of course not described with the necessary exactness to enable us to determine the species or breed. In bogs, and the deposits of lakes, especially in those of Loch Gur, its bones and skulls have been found in numbers. Many of the latter show fractured indentations on the forehead.‡

The antiquity of the Long-fronted Ox has been lately disputed by Professor Boyd Dawkins, who is of opinion that this Ox and the Goat were brought to Great Britain from the Continent by man long after the larger animals had disappeared—some time in the period which intervened between the commencement of the formation of bogs on the ancient Irish lakes, and the first historical evidence of the animals of the country. It is doubtful, however, whether or not we have sufficient evidence as to the exact antiquity of this Short-horned Ox. It would seem that remains have recently been found both in conjunction with the Bison and Giant Ox, Elephant, and Rhinoceros in England, and in lacustrine marls in Ireland, associated with bones of the Great-horned Deer. Looked on in connection with the origin of our cattle, it seems at all events, whether descended from the *Urus* or any other wild

* The American Bison has fifteen pairs of ribs, while the European has fourteen. As regards the Aurochs, no fossil skeleton has been found sufficiently perfect to show the exact number of ribs it possessed.—ED.

† In a curious Irish MS. of the ninth century, wild oxen are spoken of as inhabiting the county of Clare.—A. L. A.

‡ Many of these cuts are small, and may have been produced by blows from the narrow bronze hatchets (celts) plentifully discovered throughout the country.—A. L. A.

species, to have contributed towards the tamed stock; none of these, however, retain its well-marked cranial characteristics, which are conspicuously shown in the lengthened forehead. There are decidedly, however, as far as Ireland is concerned, very many variations in the curvature of the horns of skulls dug out of peat, which would seem to point to a long course of domestication; at all events, whether the animal was or was not a wild denizen of the land, it was very generally reared and eaten in England and Ireland during the early colonization of the islands.

Few facts in the natural history of the British Islands are more surprising than that elephants, rhinoceroses, and a species of hippopotamus once dwelt in our land, when its physical aspect was not materially different from what obtains at the present day. No doubt these and other extinct mammals were more plentiful when Great Britain formed part of the continent of Europe, and when the Thames and other rivers were broader, as testified by their deposits. Still there is evidence to show that they lingered on after Great Britain had become separated from the mainland, a few only surviving the prehistoric period.

The Thames valley in olden times, as shown by the animal remains found in its deposits—*i. e.*, remains of elephants, rhinoceroses, and river-horses, deer, oxen, and so forth—must have presented a wilder aspect than even the banks of the upper Nile at the present day.

Not many years ago, whilst some workmen were employed in deepening a cellar below a club in Charles Street, St. James's, they discovered the grinding tooth of an Elephant, a portion of the back-bone of the Giant Ox, and the curved canine tooth of a Hippopotamus, all in the clay which underlies the gravel so well known to London geologists.

THE GREAT HIPPOPOTAMUS, which inhabited England before the glacial epoch, returned again at its close, along with other quadrupeds. It appears to have been not uncommon, seeing that remains have been found in bone caves in Devonshire, South Wales, Somersetshire, Huntingdonshire, Cambridgeshire, Bedfordshire, Gloucestershire, Middlesex, and Yorkshire, and in the deposits of the rivers Thames, Ouse, Cam, and Avon. There is only one record, and that not well authenticated, of its occurrence in Ireland,

a canine tooth having been found near Carrickfergus, and in Scotland no traces have turned up.

In size and character the extinct river-horse of North-western Europe differed in some degree from the present denizen of the Nile, which even in historical times was plentiful in Egypt, where teeth of individuals have been discovered in river alluvium as large as those of many of the Great Hippopotamus. It may be that the former is a degenerate and modified descendant of the latter; and whilst we hesitate to associate in idea the naked hide of the Nile animal of the present day with our colder climate, enough is known of the Hairy Elephant and Rhinoceros, which dwelt here contemporaneously, to warrant the inference that the Hippopotamus may also have had a woolly coat.

Great Britain, or rather the area embraced by the insular group, during that epoch which preceded the glacial period—when, as has been already remarked, the aspect of the country, so far as its plains, rivers, mountains, and valleys were concerned, did not differ materially from what obtains at the present day—was tenanted by two species of elephants, one of which, the Southern Elephant, did not re-appear on the scene after the glacial ice and snow had begun to yield to the coming temperate climate. The other species, named the Ancient Elephant, returned to its old haunts, and the Mammoth Elephant appears now on the scene for the first time. At all events, so far as has been ascertained, there are no indications of the latter having arrived beforehand, as none of its remains have been discovered in deposits anterior to those of the glacial period.

The discovery of an entire Mammoth in the flesh, at the commencement of the present century, in frozen soil at the mouth of the river Lena, and the subsequent removal of the carcase to St. Petersburg, where it now remains, show that, like the Hairy Rhinoceros hereafter mentioned, it was an animal adapted for a cold climate.

THE MAMMOTH at the period under consideration, and up to a late geological date, had an almost world-wide distribution. Its tusks are found in such quantities along the Siberian shores and islands to Behring's Straits, that a thriving trade in ivory has resulted, whilst the fishermen on the coast of Norfolk have dredged up many thousand grinders and tusks of the animal. It has left

its remains in North America as far south as Mexico, and in Europe from the frozen seas to Rome. In Great Britain it has been traced throughout England, Wales, and the south of Scotland, and remains have been found in two widely distant localities in Ireland.* In fact, of all¹ the ancient British mammals the Mammoth was evidently one of the most common, and seems to have survived the Elephant next to be mentioned. Of its contemporaneous existence with man in Europe, we have evidence not only in the discovery of stone implements along with its remains, but a few years since a fragment of the tusk of a Mammoth was found in the cave of La Madelaine in the Dordogne, on which was a rude but faithful representation of this hairy Elephant, etched by means of the stone implement of some cave dweller of the period, when, together with the Reindeer and the Bear, it roamed over Southern France.

THE ANCIENT ELEPHANT, as it has been named, was, as far as our islands are concerned, not so gigantic in stature as the Mammoth, and was distinguished by the possession of grinders formed on a very different pattern. Taken in conjunction with other differences in the skeleton, these characters afford as well-marked distinctions between it and the Mammoth as those which exist between the African and Asiatic Elephants. The Ancient Elephant has been more frequently found in middle and southern Europe than in the north-west; nevertheless, from the quantities of teeth and bones found in England, the probability is that it was at one time quite common here. In regard to geographical distribution, the exuviae hitherto discovered show that it was confined to Europe. The tusks of the Mammoth curved considerably upwards, whilst those of the Ancient Elephant much resembled the tusks of living species, and were nearly straight. In point of size, neither of the fossil species very much exceeded the largest African Elephant, although the bull Mammoth, as a rule, was considerably taller than its living representative.

Admitting points of distinction between these two extinct elephantine animals, we are naturally led to inquire how far they differed from the Asiatic and African Elephants of the present day. It may be stated generally that in its skeleton the Mammoth is closely allied to the Asiatic Elephant; so alike are they, indeed,

* Cavan and Waterford.

that, but for the peculiar construction of the grinders and the curling tusks of the Mammoth, it would be difficult to distinguish them. Allowing, therefore, for influences before referred to, we may assume that the naked skin and other differences observable in the Asiatic Elephant may be due to conditions under which the animal had lived for long ages; indeed, there appears to be a growing belief among naturalists that the Mammoth might have been the progenitor of the Elephant of Asia. In the case of the Ancient Elephant there is also an agreement, though less marked, in its teeth and bones with those of the African Elephant; but we must wait for further discoveries in the soils and caverns of Southern Europe and Asia before any more exact relationships between the living and extinct species can be determined.

THE RHINOCEROSES that inhabited Britain possessed characters which in the opinion of many naturalists warrant their division into two or three species, all of which carried two horns, like the animals now living in Sumatra and Africa, as distinguished from other species.

THE TICHLORHINE TWO-HORNED RHINOCEROS—so named from having a bony septum to its nose—was very plentifully distributed over England after the glacial period. It is the same animal which the Russian naturalist Pallas found frozen and entire, in 1771, in the sands of the river Viloni, in Siberia. The body was clad in long shaggy hair, and the flesh and skin were for the most part preserved, from constantly lying in frozen soil—how long, who is to say? At all events, no native traditions speak of the animal. Its remains (chiefly teeth) have turned up in about sixty different localities in England, and are usually associated, as in Siberia, with remains of the equally hirsute Mammoth. Its nearest living ally is the African or Two-horned Rhinoceros, which stands nearly five feet in height, with a length of eleven feet. To judge by the measurements of the individual discovered by Pallas, the above is a somewhat smaller animal than the extinct Tichorhine species.

Another fossil species (or variety, as some consider it) has been named the LEPTORHINE TWO-HORNED RHINOCEROS, and is distinguished from the last-named by a more slender body, as evidenced by its bones and teeth. The third form, named the MEGARHINE TWO-HORNED RHINOCEROS, is distinguished by the presence of

incisive teeth. The second was not nearly so plentiful as the first, whilst the third has only been met with on a few occasions in deep river deposits, thus indicating its existence before the glacial epoch. Altogether, up to the present time remains of rhinoceroses have been discovered in no less than eighty different localities in England, whilst not a trace of the genus has been hitherto met with either in Scotland or in Ireland.

THE WILD HOG was an ancient tenant of British soil, and maintained its footing as long as there were forests to give it shelter and its enemy—man—allowed it to exist. It still haunts the least civilized parts of Europe and Asia, and, by its accommodating disposition, can subsist where other herbivorous quadrupeds would perish.

It seems to have been plentiful in Great Britain, and the Boar, as a rule, was larger, and had the canines and molars more highly developed, than is usual with individuals of the species nowadays. Remains have been found associated with those of almost all the large extinct mammals, both in caverns and in river deposits. Its skull, battered in by either stone or metal axe, like those of the Long-fronted Ox, is often met with in the bogs and lake bottoms in Ireland, where large specimens have been found. It ceased to be a wild animal in that country after the beginning of the seventeenth century, but was very common in the twelfth century, according to Giraldus, who remarks:—"In no part of the world have I seen such abundance of boars and forest hogs; they are, however, small and misshapen and wary."*

A HORSE about the size of a Galloway seems to have been very common on British soil after the glacial period; indeed, single teeth, found in conjunction with remains of the Mammoth, Hippopotamus, and Rhinoceros, indicate an animal between fourteen and fifteen hands high, but the sizes of the teeth are no certain indication of the height of their owners. No doubt there were both large and small races, but, taking the bones into consideration, it may be safely surmised that the majority were about the dimensions above stated. The skulls indicate what horse dealers would designate a "fiddle head," but the limb bones imply that the owners combined strength with agility. The Horse

* *Topographia Hiberniae.*

was a native of Ireland in the days of the Mammoth and Reindeer, with remains of which it has been found in the lately excavated cave of Shandon. The extinction of this animal appears to have taken place long before any record of its existence was made. Some idea of the numbers of this ancient British Horse may be gathered from the fact that its remains have been recognized in no less than fifty different situations in England alone, and in northern, central, and southern Ireland; whilst, strange to say, it has not been identified in any deposits north of the Tweed. In fact, the Mammoth and Reindeer appear to have been the only large mammals which at that time frequented Scotland, where the climate was doubtless inimical to the habits and requirements of other species.

THE BEAVER was not uncommon in the rivers of Wales towards the close of the twelfth century, according to the Welsh author *Giraldus Cambrensis*. It was also, according to historians, a native of Scotland and England in the fifteenth century; but Giraldus asserts that it was not found in his time in Ireland, where up to the present day not a trace of its existence has been discovered. The bones of Beaver, Hare, Red Deer, Roebuck, Ox, Brown Bear, Wolf, and Boar have been dug up in peat-bogs; moreover, it lingered on to historical times, and was finally extirpated by man. A few are still to be found in the more remote and sequestered river-tributaries of Central and Eastern Europe,* and the species still flourishes in Canada, in spite of trappers and the Hudson's Bay Company.

Along with this Beaver there lived in pre-glacial times a gigantic species to which the name of Cuvier's gigantic Beaver has been given. This species, however, did not survive the glacial period, and ought not properly to be included with the quadrupeds now under consideration. The connection, however, between the two shows that the smaller and more recent species survived the intense

* In Lord Clermont's 'Guide to the Quadrupeds of Europe' (1859), it is stated (p. 83) that the Beaver, though in greatly reduced numbers, is still found in several rivers of the northern and central countries of Europe, such as the Danube, Rhine and Rhone, on which last it is recorded by Crespon as occurring from Pont St. Esprit to the sea, especially among willow plantations, on which it sometimes inflicts serious injury. It is rare in Russia, except on the Dwina and Petchora, but according to Pallas, is numerous in Siberia, Tartary and the Caucasus. As regards Siberia, see the first of the "Occasional Notes" in the present number.—ED.

cold of the glacial epoch, possibly by migrating during its continuance to Southern Europe. The comparison in size between these two Beavers, at one time contemporaneous, coupled with anatomical characters, seems to preclude the possibility of the larger being a more highly developed race of the smaller. Beavers' bones have been dug up in the lower brick-earths of the Thames, and under the streets of London, and there can be no doubt that at one time the Beaver built its dam on this river and its tributaries as well as on many other English, Scotch and Welsh streams and lakes.*

THE HARE and RABBIT have pedigrees which extend back to the days of the British Elephants, Rhinoceroses, Lions, and other large quadrupeds, nor do they seem to have been of greater size than than their present representatives, although jaws and skulls of hares have been occasionally met with somewhat larger than the same parts of any living species of the genus.

THE PIKAS or TAILLESS HARES of Northern Asia were once distributed over Europe, and several portions of their skeletons have been found in cave-deposits in England, associated with remains of nearly all the large extinct mammals.

THE LEMMING, still plentiful in Northern Europe, and renowned for its voracious habits, had a representative in England in olden times, as proved by the discovery of its remains in several cave-deposits. The Marmots or Ground Squirrels also had a compeer, as shown by the discovery of its relics in the cave of Fisherton, near Salisbury. The WATER RAT seems to have been common, also the LONG- and SHORT-TAILED FIELD MICE and the COMMON HOUSE MOUSE.

THE LARGE HORSESHOE BAT and the NOCTULE or GREAT BAT, both still natives of the British Islands, have left their bones in

* Fossil remains of the Beaver have been found in Berkshire (*Phil. Trans.* 1757, p. 112), and in Cambridgeshire (Jenyns' 'British Vertebrate Animals,' p. 34), in Berwickshire and in Perthshire (Neill, 'Wernerian Memoirs,' vol. iii., p. 207). In the ninth century the animal was known by the Welsh as "Llosdlydan" (*Leges Wallicæ*, iii., 11), and in Gaelic it is still termed from tradition "Losleathen." For some further particulars on the subject the reader may be referred to an article entitled "Beavers, Ancient and Modern," which appeared in 'The Field' of March 22, 1873.—ED.

caves; but, considering that they live in these situations and hide in crevices and holes, it is possible that the bones of recent individuals may get mingled with those of fossil animals. The same may be said of the MOLE, COMMON SHREW and HEDGEHOG; at the same time there is every probability that these animals were contemporary in many cases with the larger quadrupeds, with whose remains their bones have been found mingled.

The last of the mammals to arrive on the British Islands after the glacial period may or may not have been MAN. It is not likely, however, that he would have pushed northwards in a land destitute of the animal food on which he must have depended for his existence; it is probable therefore that the large herbivorous quadrupeds at all events preceded him. It is clear, moreover, that he lived on the same area with them, as proven by the discovery of his flint implements in conjunction with their remains in caves and peat-bogs. In Brixham Cavern flint instruments of the chase, comprising arrow and spear heads, axes and knives of stone, have been found mingled with the broken bones and teeth of the Bear, Lion, Great Horned Deer, Reindeer, Red Deer, Roebuck, Wild Horse, Elephant and Rhinoceros. In Kent's Cavern, at Torquay, where the Fauna were more numerous, the same conditions have been observed. In the Gower Caves, Wokey Hole, and many other situations, the proofs of man's contemporaneous existence with these extinct animals are placed beyond a doubt. It is clear, moreover, that in some instances he contributed towards, and in others succeeded in, exterminating many of the quadrupeds just mentioned; but, so far as the evidence yet extends, it is not certain that he dwelt on British soil before the glacial period.

Although stone implements, more or less rude in construction, have been discovered in Ireland and Scotland, there are no recorded instances of their having been found associated with the bones of any extinct quadrupeds; at the same time there can be little doubt that the stone arrow and spear points, wherever found, are indications of the venatorial habits of the people who fabricated them. The evidence perhaps is more circumstantial than direct; but, taking into consideration the small number of flint tools found in Ireland, with the abundance of the remains of its giant deer, it is probable that, if man existed on the island at a time when it was overrun by herds of this animal, he would have destroyed them,

and their broken bones would bear traces of his violence.* But this is not the case; whilst in England the long bones have often been found broken in such a manner as to indicate that they were split by man for the sake of the marrow which they contained.

Such are a few of the most remarkable animals which lived and died on British soil during what may be styled a period insignificant in duration as compared with the antiquity of the æons which preceded. It is not the object of the writer to deal with the details from which the various periods have been differentiated; but, in conclusion, the reader is invited to realise the belief, founded on a study of the phenomena as deciphered by such geologists as Lyell, Ramsey, Forbes, and others, that the intervals of time, both before and after the junction and separation of the British Islands and the European Continent, embrace four distinct periods. These may be set down as follows:—

Period I.—A general continental land, when the British area was a continuous portion of Western Europe.

Period II.—A submergence by which the land north of London and the Thames, and Bristol with Ireland, was reduced to an archipelago of frozen islands.

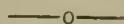
Period III.—When the sea-bed rose again, and the land equalled if not exceeded in extent that of the first period; the physical outline, as far as the mountains and rivers are concerned, being at first much the same as at present, only that the land rose higher above the sea, until the cold or glacial period, when the land first sank, and then was re-elevated, when the climate, still rigorous, gradually became milder, and the animals, many of which had

* The statement made by Mr. Betham in 'The Field' of the 25th December, 1876, regarding the discovery of a flint arrow-head in the rib of an Irish Elk, would, of course, at once settle the point at issue. It is not, however, by any means the only asserted instance known to the writer; but unfortunately the objects have not been preserved, whilst all so-called examples hitherto subjected to the critical inspection of comparative anatomists have been proven to be the result of injuries or disease, not inflicted or caused directly by human agency. The natural historian, therefore, is bound to be careful in accepting evidence, unless authenticated by competent authorities, or the presence of the objects themselves. A rib of an Irish Elk with a hole through it is figured in Owen's 'British Fossil Mammals.' This may have been done by man, but the chances are that the injury was caused by the point of an antler of an antagonist.—*A. L. A.*

retired to the south as the glacial period set in, again returned to their former haunts, whilst not a few became extinct.

Finally, Period IV.—After an interval, more or less lengthened, the ultimate separation of the British Islands from the European Continent, and of Ireland from England took place, resulting in the geographical outline now delineated in a map of Europe.

Unreckoned ages are included in these changes, and no one can form even an approximate idea, according to modern computation, of their extent or duration.



THE NATURAL HISTORY OF DONEGAL.

[At a meeting of the Glasgow Natural History Society, held on the 30th January last, the following paper, entitled "Notes on the Natural History of County Donegal, with some Account of its Archaeology," by Mr. James A. Mahony, Corresponding Member, was read. The paper was illustrated by an enlarged map of County Donegal, and was accompanied by lists of the phanerogamous plants and ferns, and of the birds of the district.]

A GLANCE at a map of Donegal will show that it is a county of considerable extent, generally very hilly, and with a coast line of most irregular character. Lough Swilly, Mulroy Bay, and Sheep-haven are arms of the sea penetrating southward from the Atlantic from twelve to sixteen miles, and modifying the climate so much that when snow falls, as it does very rarely, it never lies, but disappears in a very short time. These deep-sea fiords, with their rich marine fauna and flora, the coast outside beaten by the Atlantic surge, the numerous fresh-water loughs—many of them of considerable size—the bogs, mountains, marshes, sands, and cultivated grounds, present such a variety of conditions as is most favourable to the student of Natural History. I propose briefly giving some account of the Geology, Botany, Zoology, and Archaeology of the district.

The primary and metamorphic rocks form the backbone of the County Donegal. In very local patches, and in small quantities, the more valuable minerals and metals occur. Lead, copper, silver and gold have been found, but so sparingly as would not repay the expense of working. The post-tertiary deposits are everywhere met with, and are often full of interest. The boulder clay is very

general over the county, but, unlike its equivalent near Glasgow, it is a loose agglomeration of sand and hunch-backed pebbles and large stones. At Bloodyforeland it forms a cliff 110 feet in height, the matrix being a drab-coloured clay. Overlying the boulder clay in many places is a coarse gravel, highly charged with peroxide of iron; and where this is overlaid by the turf the stratum of gravel in contact with it is seen to be white instead of a reddish colour: this seems to be caused by the deoxidation of the iron by the organic matter in the turf. Bog-iron is to be found wherever the land is bleak and barren, and hundreds of tons of it are shipped annually to England, where it is used instead of lime for the purification of gas. Along the shores of Lough Swilly a light blue clay is found about forty feet above the present sea-level: it contains numerous fragments of shells, and seems to mark the old sea-beach. Bog is the surface deposit on a large portion of the county, and in some places it is as much as twenty feet deep, with trees occurring abundantly in it. In an island in the Rosses district the sea beats against a seven-feet cliff of bog, and in different places trees can be seen submerged, and the structures known as "smelting-pots," which were used some centuries ago for reducing iron, have been seen in three fathoms water. These facts point to a comparatively recent depression of the land, and this is apparently going on, although it is in no place so well marked as in the Rosses district.

The influence of plant-life in modifying geological conditions is not so often referred to nor so well understood as its influence in modifying climate. An instance of the former may be noticed. At Glassagh, in the district of Faunett, thirteen miles from Ramelton, the shores at one time were very sandy, and the kelp made from the seaweed cast in there brought only a low price; but some years ago the Earl of Leitrim planted all the bare sand above high-water mark with bent, which has held the sand together, so that now enough vegetable soil has been produced as permits of the growth of a sward composed of *Viola tricolor*, *Anthyllis vulneraria*, *Erodium cicutarium*, some of the coarse grasses and arenaceous mosses. The sand has been gradually disappearing, and the shore consists now of granite rock and beautiful pebbly strands, enabling the cottars to secure the weed free from sand, and to get the highest price for their produce. On the same Fannet coast the marine Algae may be studied without much effort,

as every tide washes in very perfect specimens of many of the deep-sea species, while the rock-pools are brilliant with *Cladophoræ*, *Chyldadiæ* and *Polysiphonia*, and an abundance of *Codium tomentosum* and *Laurencia pinnatifida*. The economic uses of the Algæ, described as useless by old Virgil, is well illustrated here in early summer. In May the old frond of *Laminaria digitata* becomes constricted, and is pushed off by the new frond, and the first storm drives in masses of this weed, forming often a bank four or five feet in depth: the natives call it "Scie weagh," meaning the May fleece, and the scene when it is coming in is an animated one. In one bay seventy carts may be counted, the horses up to the girths in the sea, and the natives forking up the precious crop. In the Faunett district, which has a coast of six miles, 8500 tons are secured, which, when dried, produces about 400 tons. From the beginning of August till the end of September is another busy time, when the "harvest weed" comes ashore: it consists of the variety *stenophylla* of *Laminaria digitata*, which is quite entitled to be ranked as a species, as it sheds not only its frond, but also a portion of the stipes, and its structure and chemical constitution are entirely different. Leaving the shore and going further west, one is struck by the abundance of the royal fern, which, instead of being the nearly extirpated rarity it is in the Clyde Valley, is here a common weed, growing in clumps like a little forest: it is disliked by the farmers, and, along with rushes and mosses, are all to be banished by drainage, "when the times mend." Ferns are not so specifically numerous as in Scotland.

In Marine Zoology there is much to interest and delight the student. At a short distance from the shore the boat glides over a stretch of *Laminariæ*-covered bottoms, where the large *Echimus spheræ* may be seen prowling over the brown seaweed in the society of numerous star-fishes, shoals of *Medusæ*, and the beautiful zoophyte, *Cydippe pileus*, while multitudes of dogfish sport along the surface. The estuarine shores of Lough Swilly yield numerous species of Mollusca, while at Fort Stewart the whole littoral zone is covered with the shells of *Anomia ephippium* and *Pecten striatus*, and thousands of the valves of the oyster recall the days when that succulent bivalve could be bought here for threepence per hundred.

As for Mammalia, the Otter is too frequent. The Squirrel, Ferret, Fox, Weasel, Bat, and Hedgehog are often to be seen, and

it seems to be quite true that there are no toads, moles or snakes in Ireland. The Black Rat (*Mus rattus*) is said to be found in an island in Mulroy Bay, but this requires confirmation.

Donegal can give a good account of birds, from the lordly Eagle downwards. The Golden Eagle has been often shot, and sometimes captured alive. The Peregrine Falcon and Merlin have been kept for long periods in confinement; and some have succeeded in making pets of the Barn and the Tawny Owl. There is a sufficient variety of song birds to keep up an interest in these charming neighbours. The Song Thrush (*Turdus musicus*) makes musical the dawn and gloaming from February till the middle of April: one fine performer which sings in a horse-chestnut in the garden brings flocks of the villagers specially to hear what they call the "Irish Nightingale." The Wren, Bullfinch and Swallow build about the houses, as do numerous Blackbirds; and in winter may be seen every day the Common Crane,* the Waterhen, and the Cormorant, and sometimes the gleam of the Kingfisher may be marked in his swift flight up the stream. Wigeon, Teal, and Bernicle Geese frequent the muddy flats of the Swilly in winter, and are shot in numbers by those enthusiasts who choose to lie out all night in a flat-bottomed boat.

By the student of antiquity the County Donegal is held in reverence as the birth-place of St. Columb, and numerous are the legends connecting him with every hill and lough. The island of Tory is said to have been the scene of his missionary labours and miraculous exploits; but be that as it may, it is an island full of interest to the antiquary. Besides the old croms and round towers, which have been so carefully built that they resist effectually the climatic influences, and justify the poet in speaking of them as "the conquerors of time," the crannoges, or lake dwellings, which in the earlier periods of Irish history were preferred by the Irish chiefs to buildings on the mainland, are objects of great interest. The drainage of lands, which has been going on for the last few years, has revealed many of these old dwellings, long lost to sight, and at Portlough, four miles from Ramelton, one has recently been revealed which affords a fine example of the nature and uses of these settlements. The shell-mounds, which are common in the district of Faunett, are of considerable interest: they are invariably

* The bird here intended is the Heron, which in many parts of Ireland is called the Crane.—ED.

near the shore, above high-water mark, and are easily recognisable, even at a distance, by their rising eight or nine feet above the level sand. They all contain heaps of rough stones, which may be the remains of the hut, but the bulk of the mound is composed of shells of such edible mollusks as *Littorina littorea*, *Patella vulgaris*, *Cardium edule*, &c. Bones also of the cow, horse, sheep and pig are common, and are almost always split up—an entire bone is rare. These shell-mounds are less rich in remains than those of the Hebrides, and they cannot claim to be of high antiquity; that they are not of yesterday, however, is clear from the fact that on the shore adjacent no periwinkles or limpets can now be got, and the oldest inhabitant has no tradition of their origin. Their probable date may be the fifteenth or sixteenth century.

ORNITHOLOGICAL NOTES FROM BEVERLEY.

BY FREDERICK BOYES.

A REMARKABLY cold and backward spring, with a long continuance of easterly winds, may account for the non-arrival in 1876 of at least one summer migrant and the appearance in diminished numbers of some others. But whilst it deprived us of these, it appeared so to check the northward migration of our winter birds that, in one or two instances, they found it convenient to remain and breed with us. To this cause, at least, I attribute the breeding of the Hooded Crow, Spotted Crake, and some other birds in this neighbourhood in the summer of 1876.

Although I cannot say that we had any remarkable feature worth especial mention, we had nevertheless some very interesting occurrences which were unusual and new to me. These were the breeding of the Redshank in three or four different localities; the nesting of the Red-backed Shrike, and that of the Spotted Crake, which latter fact, though not absolutely established, is so far proved that I think there is no doubt about it.

My notices of the arrival of our spring migrants are very incomplete, owing partly to the very cold weather, which prevented them giving their well-known notes, and partly to their great irregularity in arrival, so much so that in many cases I gave up looking for them. I do not at any time attach much importance to these

records, as it is manifest that at best they are very unreliable. A single bird may arrive in the neighbourhood and go unnoticed for weeks unless some one who knows it discovers it. Again, I may put down the date of my first hearing or seeing a certain bird here, whereas it may have appeared a fortnight earlier a few miles away. So, too, some birds do not make their presence known immediately on their first arrival. The Corn Crake is one of these, and it generally remains mute until sufficient shelter is afforded it: this is proved by finding them with pointers or setters when none have been heard thereabouts, or perhaps not at all that season.

On February 10th I saw, in the snow on the river-side, the footprints of a Bittern. It had walked to several places where the sedges were highest, evidently looking for a place of concealment, but the shelter apparently had not been sufficient, for it had then walked back to the water-side and taken wing. Two of these birds were seen several times during the winter at a private piece of water here, where the owner always preserves them: I am told that one or more are seen there almost every winter.

The dreadful storm of thunder and lightning we had early in March, accompanied by a deluge of rain, caused the river again to overflow its banks, and once more all our low-lying "carrs" were under water for many miles. In consequence of this, vast numbers of Peewits, which annually breed in these low grounds were driven away from their breeding haunts, and the eggs of such as had laid were of course destroyed. These low grounds called "carrs" lie adjacent to the river stretching beyond Beverley northward almost to Driffield, a distance of about twelve miles, and are liable to be submerged at any moment by the bursting of the river-banks. In former times the river annually overflowed, and all the adjoining land below a certain level became swamp and bog, and in many places open water. Indeed, up to the beginning of the present century there was no means of getting the water away. Many hundreds of ducks used to be taken here in decoys, and even now no sooner do the fields get submerged than they are at once frequented by great numbers of wild-fowl.

About the 11th of April, when the water in the "carrs" had partly subsided, a Ruff and three Reeves were seen, and the Ruff and one of the Reeves shot. The male bird was in transitional plumage, just acquiring a beautiful glossy black ruff,

and a few warts were appearing near the base of the bill; the frill, so far as it had been assumed, was composed entirely of new feathers.

During the summer of 1876 the Nightingale was absent from East Yorkshire. Considering, however, that we are on the extreme northern limit of its range, it is not surprising that it should fail to reach us in such a miserably cold and backward spring as that of 1876.

A female Hawfinch, with considerably developed eggs in the ovary, and which had been previously shot at and wounded, was picked up alive on May 7th on Westwood Common, where—as I have already mentioned (2nd ser. p. 4763)—two nests were taken last year. It appears they have again returned to the same place to breed. I afterwards made a search and found three nests, two apparently those of last year, and the third barely finished. At the last-named the old bird no doubt was at work, for it made a great outcry when I went near it. I thought it looked scarcely completed, but knowing what a flimsy and unfinished kind of nest this bird makes, I climbed up to it, and must have been seen, for it was afterwards forsaken.

On the same day a Black Tern and a Common Tern were shot on our river; and I may here mention that it is a common practice for people to go up the river in a boat on Sundays, and shoot anything and everything, whether protected by the Sea-birds' Protection or any other Act.

On the 10th May I saw a beautifully-plumaged Oystercatcher on the river-side: this is the first time I ever saw or heard of one here. The following day I heard a Ring Ouzel singing, and saw a large flock of Fieldfares. The 11th May seems a late date at which to find the last-named birds here, but they remained with us this year until May 19th.

For upwards of sixty years a pair of Missel Thrushes have nested in our garden, with scarcely an exception. This spring the old gardener came to me, with a mournful look, and said he was afraid something was going to happen, as he had not noticed them about as usual; but when I pointed out to him the old bird sitting on her nest high up in a pear tree, his face brightened up, and he said, "Hey! well, that's all right! I am glad." So much for superstition. Last year they built in a tree overhanging the middle walk, and the old bird flew off every time anyone went near. I was

surprised at the length of time she remained away from the nest, and fully expected the eggs would be addled, but she hatched off safely. This year she sat so close that, for so shy a bird, I could not have credited it had I not been a witness of it. She would allow me to fire off my gun beneath the tree without quitting the nest. I had been constantly shooting Sparrows for some time before I noticed this. Twice these Missel Thrushes have reared two broods in the same nest. There are three or four trees in which they invariably build, but very seldom nest two years in the same tree. Only one pair returns each year.

A male Shoveller and a male Teal were seen on the river on May 21st, which looked as if the ducks of each species were sitting somewhere in the neighbourhood.

In the "carrs" near the river, about six miles from Beverley, two pairs of Redshanks were nesting, for the first time, to my knowledge, on May 24th. No doubt the swampy nature of the ground from the recent floods had invited them to remain. The actions of these birds were very interesting and new to me. They toyed about a long time and were very noisy; one of them alighted on some posts and rails near me, whistling and making a chatting noise like the word "chick, chick, chick, chick," repeated any number of times. Presently it rose on the wing and flew a little way, gave a few very rapid vibrations of its wings, then held them pointed downwards in a peculiar manner, reminding one of the Common Sandpiper as it skims along a drain, or a butterfly that has been nipped the wrong way in the net. Every now and again it would return and go through the same performances. A Dunlin in full summer plumage, on the river the same day, was probably on its way to its breeding haunts.

On May 27th four young Redshanks, a few days old, were found, and I regret to say the old female, after five or six unsuccessful shots, was killed, on one of our commons called Swinemoor. This common lies very low, and was once a swampy morass where the Bittern and Redshank held their sway: it is now drained and made into a pasture for cattle and a so-called "recreation ground" for the people. [We regret to learn that the Wild Birds Protection Act is not more respected there. A momentary consideration ought to convince the shooter that a nesting bird is as useless for the table as, from its ragged state of plumage at this season, it must be to the collector.—ED.]

The Red-backed Shrike is a very rare bird here, and I cannot hear that one has been seen for fifteen years. On May 27th a hen bird of this species was shot, and the following day a pair were obtained. A circumstance occurred in connection with the capture of these birds that is perhaps worth mentioning. It appears the male and female were both sitting on a dead branch near each other when the female was shot. The person who shot it repaired to the same place early the following day to shoot the male, when he found a second female: this he shot, and later in the day he shot the male. Is it possible that the male had two wives? It is scarcely reasonable to suppose that he could have picked up another mate in so short a time in a part of the country where these birds are so rare. I ought to mention that the first female was laying, and had an egg fully developed in the ovary. A search was afterwards made, and the old nest containing one egg found near the spot where all the three birds were shot. The second female was a younger bird, and showed no signs of breeding, the eggs in the ovary being very small. The stomachs of these birds contained nothing but humble-bees, the largest and commonest kind, with the yellow bands on the abdomen. [What a thousand pities that these inoffensive birds should have been shot, especially since they are stated to be so rare in the neighbourhood.—ED.]

I think I may safely say that the Spotted Crake nested on the margin of our river in May, 1876. I have never before heard them in the summer, though we generally have plenty in the autumn. The males begin to call at dusk, like Corn Crakes or Quails, only the note is very different, and may be imitated by pronouncing quickly the words "gluck, gluck" every three or four seconds. They were calling loudly on May 27th, and continued to do so for some weeks, almost always in the same places. I sought diligently for a nest, but from the large amount of shelter afforded by the sedges at this time of year, I was not able to find it.

On June 5th a Nightjar was sitting on two eggs. I have seen several of these birds sitting on their eggs here in the open moory ground, and it is by no means a fact that they always turn their heads away from the sun. [From our own observations we can confirm this. No bird is fonder of basking in the warm sunshine than the Nightjar. We have found it sitting on the shingle at the seaside, where the stones were so hot with the noonday sun that the hand could scarcely bear the contact.—ED.]

During the month of October last we had an immense number of wild geese in this neighbourhood, more than have been known for a very long time. I think they were attracted by the quantity of food, for in consequence of the long continuance of wet weather many of the wold farmers were unable to gather the rakings of the stubble, and these formed an abundance of food for the wild geese, which at early dawn arrived in hundreds. On the 15th of that month a very fine female Rough-legged Buzzard was shot at Holderness. On the 21st another was shot: it had been seen in company with the one killed on the 15th: this bird unluckily fell into the Humber, and the tide going out it was lost. On the 18th November a third was killed at Hull.

A Shore Lark was shot at Spurn on October 21st, and an immature male Longtailed Duck on November 8th. On the 22nd of that month another Longtailed Duck was shot, a female, and on December 8th a third. These were obtained on the same piece of water where I had seen a small flock on September 29th.

On the 22nd November a fine male Osprey was brought for my inspection by Mr. D. Burton, of Cherry Burton, a village three miles west of Beverley: it had been shot the previous day by one of that gentleman's keepers just in front of the Hall. I may say that it was a most unlikely place for such a bird, as there is no water in the immediate neighbourhood. Probably it was passing over on its southward journey, or it may have got lost during the thick weather which prevailed about that time. Why it did not soar high enough to keep out of gunshot I cannot tell. I dissected it, and found it in very good condition, although not fat. The stomach was empty, except a piece of stick and some dead grass—foreign substances, swallowed, no doubt accidentally, with its natural food. This is the bird mentioned by Mr. Cordeaux as shot on the 23rd November, which is the wrong date, as I had word sent to me by the keeper the very day of its capture, and the bird was in my hands the following morning.

During the last week of November large flocks of Wood Pigeons (Ring Doves) passed over the town of Beverley, the wind at the time being westerly. These birds may generally be seen flying over this district during strong westerly gales, and invariably fly against the wind.

An old male Rednecked Grebe shot on our river on December 5th still retained some of the red on the throat.

There was a very large advent of wild-fowl in the Humber on Christmas Day. My informant, who is a capital shot, and has lived on the Humber-side all his life, said he never remembered to have seen so many geese and ducks in the Humber in all his experience, and I am certain no one could be better qualified to give an opinion. Amongst the slain on this side of the Humber were three Bernicle Geese: they were shot by a young farmer, a son of the person above referred to.

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ORNITHOLOGICAL NOTES FROM ST. ANDREWS, N.B.,
DURING THE AUTUMN AND WINTER OF 1876.

By W. J. KERR.

THE ancient city of St. Andrews stands upon a small and somewhat rocky promontory on the eastern seaboard of Scotland, in front of which stretches an arm of the sea called St. Andrew's Bay, bounded on the south by that portion of the county of Fife terminating in Fife Ness (in the provincial dialect known as the "East Neuk o' Fife"), on the north by Forfarshire, terminating in the bold rocky headland called the "Red Head." To the north of the town is the small and dangerous harbour, and beyond, towards Fife Ness and the mouth of the Forth, a somewhat monotonous line of rocky coast scenery, nowhere attaining a sufficient altitude for the nesting of sea-birds. These low rocks, however, when uncovered at low tide are the favourite resort of such birds as the Turnstone, Purple Sandpiper and Rock Pipit. On the north the coast is of a perfectly different character, being flat and sandy, a natural line of sandhills preventing the sea from overflowing a low-lying cultivated country which stretches for some miles inland. Two miles to the north of the town the River Eden flows into St. Andrew's Bay. This sluggish stream forms at its mouth an estuary of some three miles in length and about a mile in width: at high tide it has the appearance of a salt-water loch and at low tide forms a considerable extent of mud-flat and mussel-scaup, peculiarly adapted to the requirements of waders, sea ducks, *et id genus omne*—an advantage, I am glad to say, which they seem fully to recognise and appreciate. Beyond the Eden to the Tay lies a bleak and wild moorland called "Tent's Muir," skirted on

the seaside by a line of sandhills. This dreary uncultivated tract of country abounds in rushy pools and peat-bogs, the home of Snipe and Duck, where doubtless long ago the "boom" of the Bittern was often heard—a sound which, alas! no longer greets the wild-fowl shooter as he returns from the evening flight-shooting. Some interesting birds breed yearly on this moor, among which may be mentioned the Eider Duck, Sheldrake, Curlew, Golden Plover, Redshank, Dunlin, and a large colony of Terns. The locality therefore must be regarded as a most favourable one from which to study the habits of wild birds in their proper haunts. I will only add that such notes as I may contribute to 'The Zoologist' will be penned solely from my own observation.

On the 2nd September I shot a Greenshank up the Eden: a few of these birds are procured every autumn, but only *en passant*; none seem to remain through the winter. During this month the mud-flats at the mouth of the river present a very lively appearance, owing to the numerous flocks of various waders which for a time pay us a visit *en route* for more southern shores. Among others I noticed several flocks of Bartailed Godwits and Gray Plovers; one of the latter which I shot—evidently a young bird of the year—was so much marked on the back with a light shade of yellow that I took it for a young Golden Plover, and it was not until I got home that, by the presence of the hind toe, I detected the species. The first wild geese seen this autumn were observed flying over the links on September 26th.

Early in October a great number of Gannets were fishing in the bay, mostly young birds of the year, doubtless from the Bass Rock, which is but a short distance off. On the 7th a Red-breasted Merganser was shot. Enormous flocks of Plovers, both Green and Golden, breed on the hills inland, and frequent the mud-flats at low tide and the adjoining fields at high tide during the autumn, but leave us towards the end of October, a small number only remaining throughout the winter. Several Knots killed out of a large flock on the 16th retained traces of the summer plumage: in some specimens the whole of the breast was suffused with a light buff-colour; these are doubtless young birds of the year.

Returning home at dusk from shore-shooting on October 18th, two small waders rose close to me, and began wheeling round, uttering a plaintive but pleasing note with which I was not familiar,

eventually settling some thirty yards off. One which I shot proved to be a Little Stint. This small *Tringa* seems to be somewhat rare on this coast; I have not noticed it before, and the gunners do not seem to know it. Probably it is a regular autumnal visitor, but from its small size is apt to be overlooked. Mr. Harvie Brown informs me he has procured specimens upon the Forth on several occasions.

On the 19th October I shot a Curlew Sandpiper out of a flock of Dunlins: as they flew past me a third at least of the birds appeared to be white-rumped, but although I dropped six of the number I only procured one Curlew Sandpiper. When snipe shooting on Tent's Muir on the 27th I saw a Marsh Harrier on the wing. The Snow Bunting was first seen on the 30th, when a single bird was procured.

During the first week of November about a dozen Turnstones were observed on the rocks below the town. These birds seem to be local on this part of the coast: I generally find them about the same spot, feeding on the rocks uncovered at low tide. The first fall of snow of any consequence was on the 9th, on which day a few Bramblings were seen amongst a flock of Chaffinches and Linnets; large flocks of Larks, Fieldfares and Redwings were flying south in continued succession all day. A flock of about two hundred wild geese passed over the town on the 29th; they have been very scarce in this neighbourhood during the past autumn and winter.

On the 3rd December I noticed several Skuas chasing the Gulls that were fishing on the Eden bar. Amongst the latter was a Kittiwake: this species, although it is numerous enough during the summer, and breeds in some numbers on the Island of May—a few miles distant, is rarely seen here in the winter.

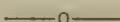
When shooting along the coast with Mr. Harvie Brown on the 6th December, we noticed flying towards us over the bay at a great height an immense number of Wood Pigeons. The flock must have been about five miles in length, and was preceded by a closely compact advanced guard, which in itself must have consisted of some hundreds of birds, the remainder following in a long straggling line. We watched them for some time after they had passed us as they flew in a north-westerly direction, until lost to sight over the Forfarshire hills. When just seen they were some miles out at sea, the coast of Norway lying behind them, and

we had no doubt that the flock we had observed was migrating from that country.

Amongst a lot of gulls seen flying along the coast on December 15th, I observed several immature specimens of *Larus glaucus*.

From the number of Short-eared Owls which were brought to a birdstuffer in the town for preservation during the month of December, it would seem as if this species had visited us in unusual numbers this winter.

During the last week of December three Whoopers visited the estuary of the Eden. I did not see them myself, but heard of them from several persons, one of whom, a famous wildfowl-shooter and good field ornithologist, informed me that a wild swan which passed within eighty yards, and which he shot at, whooped several times a note with which he is familiar from having often heard it in the Solway Firth.



ORNITHOLOGICAL NOTES FROM DEVON.

BY JOHN GATCOMBE.

IN consequence of the severe and long-continued gales during the month of January, Kittiwakes became exceedingly tame and very numerous in our harbours, and I am sorry to add that hundreds were wantonly shot. Northern Divers were plentiful and almost daily brought to our birdstuffers; but it seems remarkable that among so many specimens a really adult bird was rarely found, and I have lately been much struck with the great difference which is observable in the plumage of the fully adult bird in winter and that of the young bird of the year. Although all the upper plumage of the old bird is more or less tipped and edged with gray, yet the general markings have not that wavy appearance so observable in the young, but show a great resemblance in form to the white spots and oblong square patches of the summer dress: the dark band on the neck, too, is much more conspicuous. The adult bird in winter may also be distinguished by the shape of the larger feathers of the back and scapulars, which are nearly square at the tips, instead of rounded as in immature specimens.

For some time I daily watched a large Northern Diver with my telescope, and could easily distinguish it from others, at any reasonable distance, by its plumage alone, and on visiting a

birdstuffer's shop one day I at once recognised the poor bird lying dead on the table. On examination I found that, as I suspected, it was an old bird in full winter dress. The stomach contained some crabs and a few stones, but no fish-bones.

Shags were very plentiful in January, and it was astonishing to see the ease with which they dived in the midst of a tremendous surf amongst the rocks without the least injury; indeed I have sometimes seen them washed clean over the top of a rock by a large wave. Many Gannets were obtained by the fishermen off Plymouth, either with a baited hook or the old plan of a board and fish; many also were washed ashore.

On the 6th January a large Glaucous Gull was seen flying up the Hamoaze, and on the 14th of the same month I saw another: they were both in immature plumage. On the 15th there were immense flocks of Golden Plover and Lapwings on the Plymouth Racecourse, or Chelson Meadows, which are very swampy at this season of the year. The following day a Lesser Spotted Wood-pecker was killed near Plymouth. Great Black-backed Gulls were very numerous in our harbours and on the coast.

On January 19th I observed two adult Swans flying up the River Tamar at a great height, and some days afterwards the following paragraph appeared in a Cornish paper:—"Two wild Swans, perfectly white, were killed at St. Endellion on Monday, the 25th." No doubt, the same birds seen by me.

The Bartailed Godwit seldom remains with us during the winter, but one was shot near Plymouth on January 28th. On the 31st I bought a very fine Rough-legged Buzzard, in the flesh, which was shot on Ditsworthy rabbit-warren, Dartmoor, by the warrener's grandson, a little boy about eight years of age, who killed a splendid old Snowy Owl at the same place in March, 1876. This buzzard was extremely fat, and its stomach contained the remains of a small rabbit; when shot it was in company with another bird of the same species. Rough-legged Buzzards, however, are rarely obtained on Dartmoor.

I saw several immature Black Redstarts during the month of January, and I am told that some Gray Phalaropes were seen swimming off the quay at Penzance on the 25th of that month.

In February many Great Northern Divers and a few Red-throated Divers were brought to our birdstuffers; indeed the

former birds have been more plentiful during the present winter than I can remember for many years past. Mr. Stephen Clogg, of Looe, Cornwall, informs me that he observed two of them fishing above the bridge at that place—a circumstance which he had never previously noted during a residence of forty years. Through the kindness of the same gentleman, I was enabled to examine a beautiful variety of the Arctic Tern, which had been killed by a boy with a stone during the past autumn. It appears to be a young bird of the year, pure white, with the bill and legs red, but unfortunately the colour of the eyes was not noticed. It is now in the collection of Mr. J. Marshall, of Belmont, Taunton, who informs me that he has lately obtained a milk-white Jay (shot near York), a white Pipit, a pied Red-breasted Pipit, and a buff Red-breasted Flycatcher—the three latter procured in the neighbourhood of Constantinople.

During the early part of February Razorbills and Guillemots appeared in some numbers on our coasts, and many adult and immature Great Black-backed Gulls were shot. A Shieldrake—a species seldom obtained in this locality except during very severe weather—was killed in the neighbourhood on the 13th.

By February 16th Cormorants had well advanced towards their breeding plumage, gray feathers appearing about the head and neck, and the white patch above the thighs very conspicuous. A Great Spotted Woodpecker was brought to a Stonehouse bird-stuffer on the 17th of that month, and another on the 23rd: this species is much more commonly met with near Plymouth during winter than at any other time of the year. On the 22nd I observed a Black Redstart on the coast. By that date Chaffinches were in full song, and many Black-headed Gulls had assumed the dark hood. By February 26th Guillemots had assumed the perfect breeding-plumage.

—o—

OBSERVATIONS ON EGG-BLOWING.

BY EDWARD BIDWELL.

DURING the last few seasons I have had considerable experience in egg-blowing, and though endowed by nature with a good pair of natural bellows, I frequently found that blowing a hundred large eggs in an evening was no light task, and it occurred to me

that could I devise a machine for the purpose it would be a great boon to collectors.

My first attempt was with a large india-rubber syringe attached to a blow-pipe by a tube; but I found that it did not always contain sufficient air to empty the egg. I then substituted a kitchen-bellows for the syringe, but besides being clumsy it frequently broke the egg, from the handle requiring so much pressure that it moved the blow-pipe. I then procured a cylindrical bellows, shown in the engraving, and find it answers admirably, as it works very steadily, and it is easy with this to regulate the pressure of the air to the size of the egg.

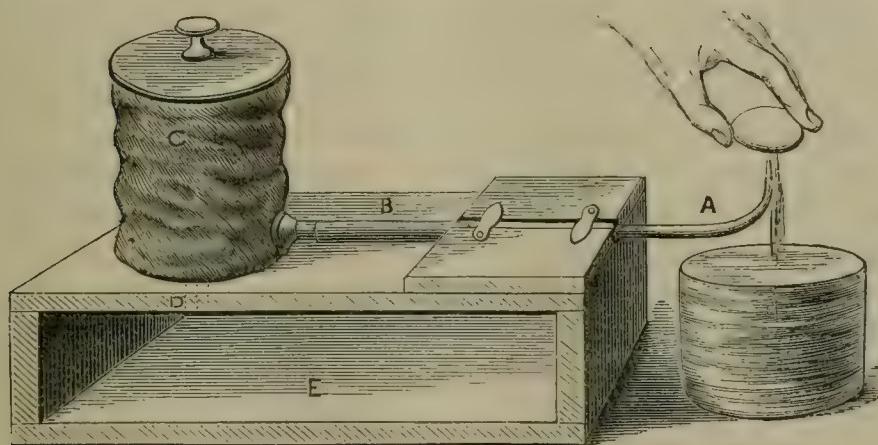


Fig. 1.

The blow-pipe (A) is held in a groove by two small buttons, so that whilst firmly fixed it can easily be removed for cleaning should it get stopped up. B is the tubing connecting the pipe with the bellows (c), which is supplied with air through a hole (D) in the wooden stand to which it is fixed. When travelling, the space E is fitted with a box for the drills, &c. For greater steadiness a block of lead weighing about two pounds is placed in the space under the bellows, or the latter can be fixed to the table by means of a small clamp. A small wooden stand is used as a rest for the left hand while holding the egg.

On the subject of drilling I should have had no remarks to offer had I not learned from Mr. Seeböhm that he used a carpenter's spiral drill for eggs, which he fixed in a horizontal position. Fig. 2 shows a small appliance which I have adapted for this purpose. It is held in a vice, and is fitted with a drill,

which is turned by hand. Should greater speed be required it can easily be fitted for a bow and the handle unscrewed.

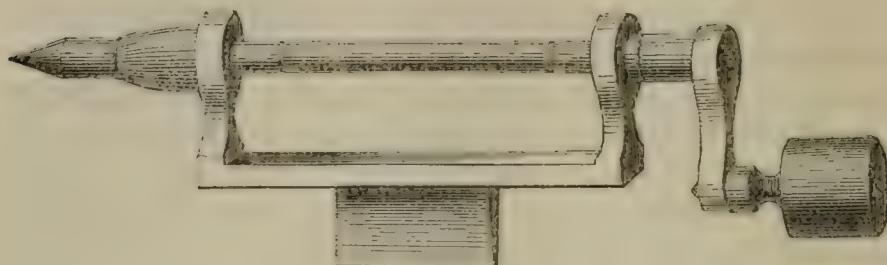


Fig. 2.

It will be found a great saving of time if, when the hole is drilled in an egg, the membrane around it be extracted with a fine pair of spring pliers. The contents come out much more rapidly, and the shell drains much sooner.*

Every egg-collector knows the annoyance and danger of cotton-wool, &c., adhering to eggs through their not having drained thoroughly, which is frequently caused by the egg rolling after it has been placed on the blotting-paper pad. To obviate this I have had thin brass tubes of different sizes cut into lengths varying from one-fourth to five-eighths of an inch and bent to an oval. If the egg is placed in this with the hole touching the blotting-paper, the nuisance of its moving is done away with. The rings fit into each other, and so take up very little room.

A small india-rubber syringe possesses great advantages over the old-fashioned "squirt" for injecting water for rinsing, as it can be used with one hand whilst the egg is held in the other, thus lessening the danger of breakage, and enabling the user to keep the exterior of the shell dry—a matter of greater importance than many consider it.

Now that collecting "clutches" is so much in vogue, it is of greater importance than formerly to bring home each "clutch" intact, and to secure this I use round tin boxes, into which five pill-boxes have been glued in a circle, thus forming six compartments. Each egg is wrapped in cotton-wool and placed in a division. Every box is numbered, and particulars of its contents entered in a rough note-book on the spot. Another good plan is

* There is another advantage in extracting the membrane. If allowed to remain in, it often contracts so much in drying as to cause thin shells to crack.—ED.

to wrap each egg in tissue-paper after rolling it in wool, as, if this is not done the egg frequently works out of the wool and gets broken.

The whole of the apparatus described fits into a box twelve inches long by six inches deep and six wide, and may be seen at Messrs. T. Cooke & Son's, 30, Museum Street, London, who will be happy to show it.

—o—

WILD FOWL PRESERVATION.

[We have received so many enquiries concerning the "Wild Birds Protection Act, 1872," and the "Wild Fowl Preservation Act, 1876," from correspondents who are anxious to know how the law at present stands on the subject that we think it desirable to print the two Acts *in extenso*. In doing so, we need only observe that had the legislature acted upon the recommendations of the promoters of the Bill of 1872, that is to say, the Committee of Naturalists appointed by the British Association, there would now have been one Act instead of two, much confusion would have been avoided, and such a period would have been fixed for the close-time as would have met with general approbation. Unfortunately the recommendations referred to were not adopted.—ED.]

[35 & 36 Vict., Chapt. 78.]

AN ACT FOR THE PROTECTION OF CERTAIN WILD BIRDS DURING THE BREEDING SEASON.

[10th August, 1872.]

WHEREAS it is expedient to provide for the protection of certain wild birds of the United Kingdom during the breeding season:

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same:

1. That the words "wild bird" shall for all purposes of this Act be deemed to include the birds specified in the schedule to this Act; the word "sheriff" shall include steward and also sheriff substitute and steward substitute.

2. Any person who shall knowingly or with intent kill, wound, or take any wild bird, or shall expose or offer for sale any wild

bird recently killed, wounded, or taken, between the fifteenth day of March and the first day of August in any year shall, on conviction of any such offence before any justice or justices of the peace in England or Ireland, or before the sheriff or any justice or justices of the peace in Scotland, for a first offence be reprimanded and discharged on payment of costs and summons, and for every subsequent offence forfeit and pay for every such wild bird so killed, wounded, or taken, or so exposed or offered for sale, such sum of money as including costs of conviction shall not exceed five shillings, as to the said justice, justices, or sheriff shall seem meet, unless he shall prove to the satisfaction of the said justice, justices, or sheriff that the said wild bird was or were bought or received on or before the said fifteenth day of March, or of or from some person or persons residing out of the United Kingdom: Provided nevertheless, that every summons issued under this Act shall specify the kind of wild bird in respect of which an offence has been committed, and that not more than one summons shall be issued for the same offence.

3. Where any person shall be found offending against this Act, it shall be lawful for any person to require the person so offending to give his Christian name, surname, and place of abode, and in case the person offending shall, after being so required, refuse to give his real name or place of abode, or give an untrue name or place of abode, he shall be liable, on being convicted of any such offence before a justice of the peace or the sheriff, to forfeit and pay, in addition to the penalties imposed by section two, such sum of money not exceeding ten shillings as to the convicting justice or sheriff shall seem meet.

4. All offences mentioned in this Act which shall be committed within the jurisdiction of the Admiralty, shall be deemed to be offences of the same nature and liable to the same punishments as if they had been committed upon any land in the United Kingdom, and may be dealt with, inquired of, tried, and determined in any county or place in the United Kingdom, in which the offender shall be apprehended or be in custody, in the same manner in all respects as if they had been actually committed in that county or place; and in any such information or conviction for any such offence, the offence may be averred to have been committed "on the high seas," and in Scotland any offence committed against this Act on the sea coast, or at sea beyond

the ordinary jurisdiction of any sheriff or justice of the peace, shall be held to have been committed in any county abutting on such sea coast, or adjoining such sea, and may be tried and punished accordingly.

5. Where any offence under this Act is committed in or upon any waters forming the boundary between any two counties, districts of quarter sessions or petty sessions, such offence may be prosecuted before any justice or justices of the peace or sheriff in either of such counties or districts.

S C H E D U L E.

Avocet	Nuthatch	Stonechat
Bittern	Owl	Stonehatch
Blackcap	Oxbird	Summer Snipe
Chiffchaff	Peewit	Swallow
Coot	Phalarope	Swan
Creepet	Pipit	Swift
Crossbill	Plover	Teal
Cuckoo	Plovers-page	Thick-knee
Curlew	Pochard	Titmouse, Long-tailed
Dotterel	Purre	Titmouse, Bearded
Dunbird	Quail	Wagtail
Dunlin	Redpoll	Warbler, Dartford
Flycatcher	Redshank	Warbler, Reed
Godwit	Redstart	Warbler, Sedge
Golden-crested Wren	Robin Redbreast	Whaup
Goldfinch	Ruff and Reeve	Wheatear
Greenshank	Sanderling	Whinchat
Hawfinch or Grosbeak	Sand Grouse	Whimbrel
Hedgesparrow	Sandpiper	Wigeon
Kingfisher	Sea Lark	Woodcock
Landrail	Shoveller	Wild Duck
Lapwing	Siskin	Wood Lark
Mallard	Snipe	Woodpecker
Martin	Spoonbill	Wood Wren
Moor (or Water) Hen	Stint	Wren
Nightingale	Stone Curlew	Wryneck
Nightjar		

[39 & 40 Vict., Chapt. 29.]

AN ACT FOR THE PRESERVATION OF WILD FOWL.

[24th July, 1876.]

Whereas the wild fowl of the United Kingdom, forming a staple article of food and commerce, have of late years greatly decreased in number by reason of their being inconsiderately slaughtered during the time that they have eggs and young; and whereas, owing to their marketable value, the protection accorded to them by the Act of the thirty-fifth and thirty-sixth years of the reign of Her present Majesty, chapter seventy-eight, intituled "An Act for the protection of certain wild birds during the breeding season," is insufficient; it is expedient therefore to provide for their further protection during the breeding season:

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. The words "wild fowl" shall, for the purposes of this Act, be deemed to include the different species of Avocet, Curlew, Dotterel, Dunbird, Dunlin, Godwit, Greenshank, Lapwing, Mallard, Oxbird, Peewit, Phalarope, Plover, Plover's Page, Pochard, Purre, Redshank, Reeve or Ruff, Sanderling, Sandpiper, Sea Lark, Shoveller, Snipe, Spoonbill, Stint, Stone Curlew, Stonchatch, Summer Snipe, Teal, Thick-knee, Whaup, Whimbrel, Wigeon, Wild Duck, Wild Goose, and Woodcock; the word "sheriff" shall include steward and also sheriff substitute and steward substitute.

2. Any person who shall kill, wound, or attempt to kill or wound, or take any wild fowl, or use any boat, gun, net, or other engine or instrument for the purpose of killing, wounding, or taking any wild fowl, or shall have in his control or possession any wild fowl recently killed, wounded, or taken between the fifteenth day of February and the tenth day of July in any year, shall, on conviction of any such offence before any justice or justices of the peace in England or Ireland, or before the sheriff or any justice or justices of the peace in Scotland, forfeit and pay for every such wild fowl so killed, wounded, or taken, or so in his possession, such sum of money not exceeding one pound as to the said justices or sheriff shall seem meet, together with the costs of the conviction.

3. The Home Office as to Great Britain, and the Lord Lieutenant as to Ireland, may, upon application of the justices in quarter sessions assembled of any county, extend or vary the time during which the killing, wounding, and taking of wild fowl is prohibited by this Act; the extension or variation of such time by the Home Office shall be made by order under the hand of one of Her Majesty's Principal Secretaries of State, after the making of which order the penalties imposed by this Act shall in such county apply only to offences committed during the time specified in such order; and the extension of such time by the Lord Lieutenant shall be made by order to be published in the Dublin Gazette, and a copy of the London Gazette or Dublin Gazette containing such order shall be evidence of the same having been made.

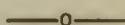
4. Where any person shall be found offending against this Act, it shall be lawful for any person to require the person so offending to give his Christian name, surname, and place of abode; and in case the person offending shall, after being so required, refuse to give his real name or place of abode, or give an untrue name or place of abode, he shall be liable, on being convicted of any such offence before a justice of the peace or the sheriff, to forfeit and pay, in addition to the penalties imposed by section two, such sum of money not exceeding two pounds as to the convicting justice or sheriff shall seem meet, together with the costs of the conviction.

5. One moiety of every penalty or forfeiture under this Act shall go and be paid to the person who shall inform and prosecute for the same, and the other moiety shall, in England, be paid to some one of the overseers of the poor, or to some other officer (as the convicting justice or justices may direct) of the parish, township, or place in which the offence shall have been committed, to be by such overseer or officer paid over to the use of the general rate of the county, riding, or division in which such parish, township, or place shall be situate, whether the same shall or shall not contribute to such general rate; and in Scotland, to the inspector of the poor of the parish in which the offence shall have been committed, to be by such inspector paid over to the use of the funds for the relief of the poor in such parish; and if recovered in Ireland, such penalty shall be applied according to the provisions of the Fines Act (Ireland), 1851, or any Act amending the same.

6. All offences mentioned in this Act, which shall be committed

within the jurisdiction of the Admiralty, shall be deemed to be offences of the same nature and liable to the same punishments as if they had been committed upon any land in the United Kingdom, and may be dealt with, inquired of, tried, and determined in any county or place in the United Kingdom in which the offender shall be apprehended or be in custody, in the same manner in all respects as if they had been actually committed in that county or place; and in any information or conviction for any such offence the offence may be averred to have been committed "on the high seas;" and in Scotland any offence committed against this Act on the sea coast, or at sea beyond the ordinary jurisdiction of any sheriff or justice of the peace, shall be held to have been committed in any county abutting on such sea coast, or adjoining such sea, and may be tried and punished accordingly.

7. Where any offence under this Act is committed in or upon any waters forming the boundary between any two counties, districts of quarter sessions or petty sessions, such offence may be prosecuted before any justice or justices of the peace or sheriff in either of such counties or districts.



OCCASIONAL NOTES.

BEAVERS IN SIBERIA.—The Beaver which, some centuries ago, was so numerous in Russia and Western Siberia, and which was supposed to have totally disappeared from both countries, continues to exist on the rivulet Pelyin. M. Poliakoff has procured from an ostyack on the Obi five skins of these animals killed last year, and he has engaged a hunter to procure this winter complete specimens for the Museum of the St. Petersburg Academy. No farther back than a century ago the Beaver was common on one of the affluents of the Irtysh, Bobrotka, but it has now totally disappeared from the locality, the last colony existing probably on the Pelyin.—*'Nature,' 18th January, 1877.*

ON THE BREEDING OF THE OTTER.—I am very glad to see that the breeding of the Otter is attracting the attention of your correspondents, and trust the result may be something more definite than the stereotyped "three to five young ones in March or April." I have long paid great attention to the habits of the Otter in the county of Norfolk, and so far as I have been able to ascertain with certainty, the young ones are almost invariably born in the dead months of the year. I read with interest Mr. A. H. Cocks' note on the breeding of the Otter (p. 100), but cannot agree with

his conclusions that "Otters, with other animals, appear to breed most commonly in the spring"; and I am inclined to think that the instances adduced tend to prove that such is not generally the case. It is very difficult to judge the age of a young Otter, they differ so much in size and weight, but judging to the best of my ability, from the data given I should think the ten young ones mentioned by Mr. Cocks would be born somewhat as follows:—No. 1, early in September; No. 2, early in January; No. 3, early in August; No. 4, October; No. 5, February; No. 6, February; No. 7, November (?); No. 8, March (?); No. 9, October (?); No. 10, May (?). There is, I think, more uncertainty about the last four than there is about the others. This shows a sufficiently wide margin certainly, but if I am right in my estimate of their age, only two of the examples mentioned appear to have been born in the spring. One of the young ones now in the Zoological Gardens Mr. Cocks says must undoubtedly have been born in the autumn, and indications mentioned by that gentleman as observed in the case of the two females now in his possession seem to point to the dead season of the year as the most probable period for the young to be born. In 'Land and Water' for March, 1873, it is stated that a young Otter which could not see (*sic*) was picked up dead on the banks of the Want, a tributary of the River Don, on the 15th December, 1872. In the same paper for January 16, 1875, two young Otters are said to have been killed while in company with their mother near Maidenhead on 10th January, 1875; and "a little baby Otter" is said to have been caught by the tail in January, 1875, by a man lying in ambush for wild duck at Llechrhyd, in the issue of the same journal for April 10, 1875. The following cases in which it is possible to form an approximate idea of the age of the young ones, or in which the condition of the female indicated the time of breeding, have come under my own notice since the paper to which you did me the honour to allude (p. 18) was published:—

February 23, 1873. A female big with young.

March 15, 1873. Female and young one; the latter 20 inches long and $1\frac{1}{2}$ lb. weight. probably six or eight weeks old.

April 12, 1873. Two young ones, both females, $25\frac{1}{2}$ inches long and $4\frac{1}{2}$ lbs. weight, and $25\frac{2}{3}$ inches long and $4\frac{1}{2}$ lbs. weight respectively—probably rather under four months old.

End of November, 1874. A female giving suck (Rev. E. J. Blofield).

November 24, 1876. A female giving suck; three teats on each side all distended with milk.

December 26, 1875. Three young ones, one of which was taken alive: when I saw it on the 30th April following I took it to be about six months old.

January 5, 1877. An old female and three young ones. The female was still giving suck (three teats on each side all in use); although the young

ones measured 35 inches long they still retained their milk-canines; the permanent canines were well grown—much larger than the milk-teeth: I have several times noticed this in young Otters. Of these three young ones I cannot guess the age, nor do I know the weight, as I did not see them in the flesh.

I mention these particularly, as they seem to tell against my theory as to the period of birth, and are almost the only instances I have met with in this neighbourhood. In my article on the Otter I was unable to say with certainty the number of teats found in the female Otter. I have now on several occasions found it to be six. As to the number of young produced at a birth, two and three appear to be about equally frequent; in only one instance have I known four—that number was found in a nest in the middle of February, 1865. The heaviest Otter I have ever seen (a male) weighed 37 lbs., and measured only 48 inches in total length, whereas I have seen a male Otter measuring 53 inches which weighed only 27 lbs.; so much for condition. A very poor female which I saw on the 16th of the present month (March) measured 43 inches and weighed only 10 lbs. I have noticed in very young Otters that they differ almost as much in comparative weight and size; so that weight is certainly not a safe indication of the age of the little one; length would be much more reliable. But I should be very glad to hear that Mr. Cocks had mated his lonely females, and was likely to observe with certainty the period of gestation and progress of the young ones. The time of pairing in confinement I do not think would be of any value as an indication of what takes place in a state of nature.—T. SOUTHWELL (Norwich).

RARE BIRDS IN THE HUMBER DISTRICT.—During the past autumn and winter I have noted the following uncommon birds in this district:—On the 6th September a rather rare wader was obtained at Spurn Point—namely, the Spotted Redshank. This example, now in the collection of Major Seddon, of Waltham Cross, is a female bird in immature plumage. Between the 21st and 27th September three Black-tailed Godwits, all females and immature, were obtained at Spurn. Also, in the same locality, a remarkably fine old male Velvet Scoter, shot October 18th. It is very curious how rarely we meet with the Velvet Scoter in any stage of plumage near our coast or within the estuary of the Humber. It is essentially a sea duck, and rarely occurs close in shore. It is far commoner at sea off the Norfolk coast than along the Lincolnshire or Yorkshire seaboard; in the former locality nearly every flock of the Common Scoter will contain one or more pairs of Velvet Scoters, readily distinguishable by the white speculum on the wing. North of the Wash it is quite a rare occurrence when at sea to come across any of these ducks. On January 21st I saw a Great Ash-coloured Shrike within a short distance of the town of Grimsby. I first noticed it perched on an upper twig in a quick-fence; on leaving

this it fortunately flew in my direction, passing within twenty yards with an undulating jerky flight, much like a wagtail's; it was apparently a bird of the year. I followed it for some distance along a double post and rail fence, the shrike keeping about five and twenty yards ahead, flitting from post to post—but always in a very dodgy manner—on the off-side of the fence, and in each flight, short as they were, dropping near the ground and rising suddenly to the post-top: when perched the tail was never still for a moment. Mr. Bailey, of Flamborough, has informed me of a Goshawk in his possession, an old female, shot by the gamekeeper to the Rev. Lloyd Greame, of Sowerby Hall, Bridlington, about the 24th of January. Mr. Bailey says the bird measured four feet one inch from tip to tip of wing, and was two feet one inch in length: it was seen by the keeper to kill a full-grown rabbit and carry it twenty yards or more.—JOHN CORDEAUX (Great Cotes, Ulceby).

WHITE-TAILED EAGLE IN HEREFORDSHIRE.—On the 18th November, 1876, I was in Henry Shaw's shop in Shrewsbury, and found he had just commenced skinning a fine specimen of the White-tailed Eagle, which had been received that morning from Berrington, near Leominster, the beautiful seat of Lord Rodney. The bird had been trapped a day or two previously, and, having been caught by only one hind-toe and not in the least degree injured, it was a thousand pities it was destroyed. It was a female, probably of the second year, as although the plumage was very handsome, being a dark mottled brown, there was no indication of the "white tail." This eagle was a very powerfully made bird, full of flesh, very muscular, and altogether in high condition. As Berrington is situated nearly in the centre of Herefordshire, and as I believe the nearest sea coast is about eighty miles distant, it is very difficult to conjecture from what locality so remarkable a bird could have wandered.—JOHN ROCKE (Clungunford House, Shropshire).

PEREGRINE FALCONS NEAR WAREHAM.—A fine pair of Peregrine Falcons have been lately trapped near Wareham, one about the 26th February, and the other—of unusually light colouring about the head and neck—on March 9th or 10th. They are apparently birds of last year, in the characteristic plumage of the first year, with longitudinal markings down the breast. It has been asserted that certain strains of this falcon, from different districts, retain their first plumage for two years sometimes, or even more. I should be glad if any of your readers can substantiate this.—A. P. MORRES (Britford Vicarage, Salisbury).

ROUGH-LEGGED BUZZARDS NEAR TISBURY, WILTS.—In the last week of December four specimens of the Rough-legged Buzzard were trapped by the keeper in a large wood at Fonthill, near Tisbury, in this county. One, a male bird, was of a light colour; two others were females, and much darker. There was a fifth bird of the same species seen about the place

at the time, but this fortunately escaped. The rough winds of the past winter would doubtless account in some measure for the unusual number of this species and that of the Short-horned Owl which have visited us this season.—A. P. MORRES.

ROUGH-LEGGED BUZZARDS IN EAST YORKSHIRE.—These birds appear to have been uncommonly numerous in different parts of the country during the past autumn and winter months, and this district has also been visited by them in some numbers. Four to my knowledge have fallen victims to the gun, and I have heard of others having been seen. The last obtained was a very fine old male, shot at Patrington on the 24th January last. This bird was very fat, and in its stomach was a quantity of fur and the remains of one or more field voles. A Rough-legged Buzzard frequented our low grounds all the winter, and was at length shot. It proved to be an immature female. The stomach contained mouse's fur, and the bird was very fat. This low-lying country has been inundated for many miles, with here and there little islands studded about, on which the rats, mice and moles were driven to take shelter, and on these there is little doubt the Buzzards fared sumptuously. I quite endorse what Mr. Selater says about second-hand information. I have had so much of it, and found it so wholly unreliable, that in a very great majority of cases it certainly is not worth printing. The so-called "eagle" sent to Beverley has come under my observation, and Mr. Selater is quite correct in his surmises. It is an immature Rough-legged Buzzard, and is at present alive and well.—F. BOYES (Beverley).

MERLINS IN KENT.—On February 4th I saw a magnificent old male Merlin here, with bright blue back and orange breast. Since that I have seen another blue male rather paler in colour, and a female. As mentioned in my note in February's 'Zoologist,' this is somewhat earlier than I usually see male Merlins here. As a general rule, females predominate in autumn and males in spring about here.—CLIFTON (Cobham Hall).

LATE ASSUMPTION OF ADULT PLUMAGE BY THE MALE KESTREL.—About the second week in January a male Kestrel was shot here, which was hardly distinguishable from an old female, except in slightly smaller size and a warmer tone of rufous on the back. The tail was slightly washed with blue, but not so much as in some old females. Even the upper tail-coverts were rufous, and the feathers on the nape were whitish, forming a rather merlin-like collar. I took it at first for a small female.—ID.

TENGMALM'S OWL IN ESSEX.—One day towards the end of January last some boys noticed a bird in a tree near the iron bridge in the Barking Road, Poplar. They frightened it out, and as the poor Owl was not used to flying by day it soon paid the penalty for its rashness in venturing out. It was brought to my office in the flesh, but as I was away the person who had it thought best to make a skin of it for me. It is a very nicely marked

specimen of Tengmalm's Owl, but I am not able to record the sex. The majority of specimens of this Owl which have been obtained in Great Britain appear to have been killed in the winter months.—EDWARD BIDWELL (Richmond, S.W.)

EAGLE OWL IN YORKSHIRE.—My brother saw an Eagle Owl which was captured by two farm servants in July, 1876, on the edge of Rombald Moor, near Ilkley. I think Pennant mentions the occurrence of this species in this county.—E. P. BUTTERFIELD (Wilsden).

[It is Montagu who mentions the occurrence of the Eagle Owl in Yorkshire. The specimen recorded by Pennant, in his 'Caledonian Zoology,' p. 18, was killed in Fifeshire.—ED.]

SNOWY OWL IN THE LEWES.—About the end of November, 1876, I received a fine adult male Snowy Owl from the island of Lewes. A friend of mine who had the shootings of Bervase, in the northern portion of the island, had seen this bird on several occasions, but both he and his keeper failed to obtain it. When he returned south, word was left with the keeper, that if he could get it "clean-killed" and would send it to Shrewsbury, he knew a collector who would be glad of it. I was much pleased shortly afterwards to find that the bird had arrived in a most beautiful state of preservation, and was nearly as white a specimen as I have ever seen. These birds have been so numerous of late in "the North" that this additional capture is not very remarkable. Still, as I believe this is the first recorded instance of its occurring in the Lewes, a notice of it may be interesting.—JOHN ROCKE (Clungunford House, Shropshire).

ORNITHOLOGICAL NOTES FROM THE WEST OF ENGLAND.—Mr. Hayden, of Fordingbridge, in the New Forest, informs me that an example of the Red-legged Hobby was killed close to that place in December last. It is singular that several birds which are only summer visitants to the South of Europe should from time to time be obtained in this kingdom in late autumn or mid-winter. Another instance of the Red-legged Falcon's having been procured in England in the winter time is mentioned in Dr. Bullmore's 'Cornish Fauna.' This specimen was shot near Falmouth in the month of February. A Peregrine Falcon was killed at Bagborough during the severe north-westerly gale which swept across Taunton Dene on the night of the 19th February last. Many trees were blown over, and by the side of a fine elm was picked up the crushed body of an old tiercel which had been roosting in the tree, and had perished with it—a singular death for a noble Falcon. The first "cold snap" (as the Americans say) brought Hawfinches into this village; on most days I see one on my lawn feeding on the red berries which strew the ground under some whitethorns. The Acts for the Preservation of Birds include several which are only rare visitors to this country, and only to be distinguished by experienced ornithologists, which might justly be

termed "fancy birds," while some which are most useful to the agriculturist have no protection, and are in consequence in great danger of extermination. There are no two more deserving members of the rural police than the White and Brown Owls: the foolish fashion of exhibiting the masks and wings of these birds in the form of hand-screens is leading to their constant persecution and slaughter, and in some parts of the country they are fast becoming scarce. A birdstuffer in Taunton informed me that on an average he mounted fifty Barn Owls and forty Brown Owls a year, and, as I have sometimes seen half-a-dozen fresh victims brought into him at once, I can well believe that these figures are not over-stated. There is another birdstuffer in the town who seems to do an equally large trade in mounting unfortunate owls. So keenly are they looked after that when a short time since a White Owl was so ill-advised as to show himself in the Priory Meadows five gunners watched patiently for him evening after evening until one succeeded in bringing him down. The natural result is an inconvenient increase of small vermin. One of the villagers here told me that last spring he trapped more than sixty field mice by one row of peas in his allotment, and that unless he had been thus vigilant in destroying these small depredators his crop would have been quite lost. Years ago he stated it would have been unusual to have trapped more than two or three. Surely it is time that something was done in the interest of poor gardeners to protect their best friends, the owls, from senseless slaughter.—MURRAY A. MATHEW (The Vicarage, Bishop's Lydeard).

PURPLE GALLINULE IN SOMERSETSHIRE.—The following are the particulars of the capture of a bird of this species, as sent me by Mr. Filleul, of Biddisham:—"A Purple Gallinule was caught in a ditch at Tarnock, in Badgworth parish, on August 23th, 1875. It is now in the possession of a farmer of the name of James Burrows, whose lads caught it. It was caught alive, and kept for a few days in a hamper. It died of starvation, I suppose, and was then stuffed. I have seen it twice; it is a very handsome bird, shaped like a Coot, but the legs are longer." I understand that another was seen at the same time.—*Id.*

SINGULAR ACCIDENT TO A KINGFISHER.—While Snipe-shooting one winter round Hickling Broad, in Norfolk, I noticed some small object splashing in the water at the side of a dyke, and on proceeding to the spot I discovered an unfortunate Kingfisher, which had come to grief in a very singular manner. The bird had evidently at some former time been struck by a shot which had passed through the upper mandible. This wound was quite healed up, but a small piece of the horny substance of the beak had been splintered, and into the crack produced by the fracture two or three of the fine fibres which form part of the flowers or seeds of the reed were so firmly fixed that the bird was held fast. It must have been flying up the dyke, and, brushing too closely to the reeds that grew on the banks, got

caught in the manner described. The struggles of the captive had broken down the reed, which was lying flat on the water, except when lifted up by the victim in its vain attempts to escape. On being liberated it flew off, apparently none the worse for the mishap.—E. T. BOOTH (Brighton).

GOSHAWK AND OTHER BIRDS IN YORKSHIRE.—On the 30th October last I was at Filey, where Mr. Brown showed me a Long-tailed Drake in most perfect plumage, which had been shot while flying over the Brigg the previous week. During the present winter several other examples have been met with, but all females or immature birds. Both the Black-throated and Red-throated Divers have been very abundant off the Yorkshire coast. On January 29th I went over to Flamborough to see Mr. Bailey; he showed me a fine adult female Goshawk, just mounted, which had been killed at Sewerby on the 23rd. This bird had frequented the neighbourhood for some time, and was shot at near Flamborough on Christmas Day, but unsuccessfully; length 2 feet, expanse of wings 4 feet 1 inch; irides, brilliant orange. On February 8th I saw in Mr. Brown's shop, at Filey, an immature Hen Harrier, killed a few days before near the cliffs. Long-eared and Short-eared Owls have been very common this winter, and many, I am sorry to add, have been killed. On February 4th a Raven was seen by Mr. Roberts flying along shore to the southward of Scarborough; twenty-five years ago he can remember a pair breeding annually in the rocks near Scarborough Castle. In our immediate neighbourhood this winter rare birds have been "conspicuous by their absence."—JULIAN G. TUCK (Old Vicarage, Ebberston, York).

HAWKS IN SUFFOLK.—In the month of September, 1876, an adult male Merlin (*Falco aeralon*), in exquisite plumage, was shot at Westley, near Bury St. Edmunds, Suffolk. A Hobby (*Falco subbuteo*) was shot in the covers at Finborough Hall, near Stowmarket, Suffolk, the latter end of January, 1877, and another was killed in the same place some months previously, but whether they were male and female I have not been able to ascertain. One or two Rough-legged Buzzards (*Buteo lagopus*) were shot in the neighbourhood of Newmarket during the month of December, 1876, but whether on the Suffolk or Cambridgeshire side I am unable to say.—H. K. CREED (Chedburgh Rectory, Suffolk).

[The occurrence of the Hobby in this country in mid-winter is noteworthy, for this bird is a summer visitant, and generally leaves us about September, or at latest in October, just as the Merlin arrives to take its place for the winter.—ED.]

SCARCITY OF THE WOOD PIGEON AND INCREASE OF THE STOCK DOVE IN THE COUNTY DURHAM.—In answer to your editorial remark, and as an addenda to my note (page 55), I beg to say that Stock Doves are now quite common here. They could not have chosen a safer retreat than the Denes in this neighbourhood afford them. They almost invariably nest

amongst the roots of the yew-trees overhanging the tops of the rocks, and are thus comparatively secure. I saw several yesterday, and also heard their grunting notes in different places, but not a Wood Pigeon was to be seen. Perhaps I ought also to have added that there were more Sparrow-hawks found nesting in this locality last year than I have ever known; they may have scared the Wood Pigeons away, but they certainly killed but few; when they do kill them the act is easily traceable.—JOHN SCLATER (Castle Eden, Durham).

[The circumstance of Stock Dove frequenting and even breeding amongst rocks is, we believe, unusual, although not unnoticed. Some years ago the fact that the Stock Dove occasionally breeds in the rocks on the Dorsetshire coast was recorded in ‘The Field,’ 14th April, 1866, and quite recently a correspondent writing in the Natural History columns of that journal (3rd March, 1877), stated that he had observed Stock Doves congregating amongst rocks at Merthyr Tidfil. He shot two of them in order to identify the species.—ED.]

PASSENGER PIGEON IN YORKSHIRE.—In the last published part of the Nat. Hist. Transactions of Northumberland and Durham (vol. v., part iii.) Mr. John Hancock records the capture of a Passenger Pigeon in Yorkshire. At p. 337 he says:—“On the 13th October, 1876, I received a specimen of this North-American bird from the Dowager Marchioness of Normanby, who stated in her letter which accompanied the bird that ‘it was shot here to day by Lord Harry Phipps.’ The bird must therefore have been killed on the 12th, and as her ladyship’s letter is headed ‘Mulgrave Castle,’ it is clear also that the bird was obtained at Mulgrave, the seat of the Marquis of Normanby.” Mr. Hancock adds that “the quill-feathers in the wings are much worn and broken, and on the forehead above the bill they are apparently worn off to the skull, as though the bird had been trying to get out of a cage or some other enclosure; therefore I cannot come to any other conclusion than that this specimen, a female, had made its escape from confinement.” It may be observed that the Passenger Pigeon has been previously recorded to have been met with in the British Islands on five different occasions as follows:—One, Monymmeal, Fifeshire, December, 1825 (Fleming, Hist. Brit. An. p. 145); one near Royston, Hertfordshire, July, 1844 (Yarrell, Hist. Brit. Birds, vol. ii., p. 317); one near Tring, Hertfordshire (Yarrell, *op. cit.*); one near Tralee, 1848 (Thompson, Nat. Hist. Ireland, Birds, iii., p. 443); and one near Mellerstain, Berwickshire (Turnbull, Birds of East Lothian, p. 41). With regard to this last, however, it is stated that a gentleman in Berwickshire had turned out several Passenger Pigeons shortly before it was shot.—ED.

BLACK STORK IN OXFORDSHIRE.—A gentleman residing at Bicester has an immature example of this rare bird, and has very kindly collected for me a few particulars concerning its capture. It was shot on the 5th August,

1865, on Osmoor, a large tract of low-lying land some nine miles N.E. of Oxford, by F. Gorum, who is well known in the vicinity of Oxford as a good shot. From him it passed to its present possessor, who preserved it. The Stork was at first mistaken for a Heron.—C. M. PRIOR (Bedford).

WILD-FOWL IN BEDFORDSHIRE.—Wild Duck, Snipe, Golden Plover, and Lapwing, have been unusually plentiful in this county this winter. The last two species might be counted by thousands, and I saw over fifty ducks reposing on the floods near to the road. There were also occasionally a few gulls. Wherever a green patch appeared above the floods it was literally crowded with Plover: I repeatedly saw a Sparrowhawk, evidently a male from his small size, dash at them, but from their habit of rising from the ground and meeting him, I could not perceive that he was successful. Owing to the extensive floods very few of these birds have been shot.—ID.

VARIETIES OF THE SKY LARK.—With the exception of the House Sparrow I think the Sky Lark is more subject to abnormal variation of plumage than any other British bird. The commonest phase is buff, but I once bought a singular slate-coloured one in Leadenhall Market. Another curious Sky Lark in my collection was netted near Stockton-on-Tees by a birdcatcher, and it appears to me that at the time it was caught it was pied, and that a diet of hemp-seed afterwards has, in addition, operated on its plumage, and turned the portions which were brown, black, so that now it is black and white—a much greater anomaly than a brown and white one would be. At one time I considered this a unique specimen, but I believe others have occurred, and one similar one is described by Mr. Hele, as a great curiosity, at p. 95 of his 'Notes about Aldeburgh.'—J. H. GURNEY, JUN. (Northrepps Hall, Norwich).

WOODCOCKS FREQUENTING THE SEA-SHORE.—Mr. Roberts, of Scarborough, tells me that in the winter of 1863-4 Woodcocks frequented the harbour to dig for worms in the mud. As some of the birds were shot there was no mistake about the species.—ID.

WINTER VISITANTS TO THE ISLE OF WIGHT.—Mr. Smith, the Newport naturalist, informs me that he has lately received the following birds for preservation:—A Common Buzzard, shot in the parish of Shalfleet, on the 23rd December; an adult female, measuring twenty inches in length, and fifty in extent of wings. The stomach contained a vast number of earth-worms, also a quantity of grass. I am reminded by Mr. Smith that a Common Buzzard was procured at the same date in 1873. A Spotted Crake was shot at Arreton. Two Gray Phalaropes were shot in December, one on the 4th, the other on the 23rd. This is a somewhat late date at which to find this migrant; in former years they have been generally met with early in the autumn. The Gray Phalarope is either more abundant than of yore, or our naturalists more observant, hardly a year passing without some appearing on our shores and inland pools. It

seems somewhat strange to find Macgillivray remarking that only one individual—unmutilated—had come into his possession; and even Mr. Morris, in 1870, refers to the Gray Phalarope as a rare visitant, saying that one had been procured here and another there. A Fork-tailed Petrel was found on the 25th December at Alverston, near Sandown, lying dead in the mill-dam, uninjured, and in good condition. The tarsus of this specimen measures but one inch, and the bill three-quarters of an inch; the closed wing exceeds the tail by a quarter of an inch; rump white, exterior tail-feathers margined with the same, and the quill-coverts have a dusky gray tinge.—HENRY HADFIELD (Ventnor, Isle of Wight).

POMARINE SKUA IN MOUNT'S BAY, CORNWALL.—During the first week of March a specimen of this Skua, approaching to maturity, as indicated by the lower part of the breast and belly being white, was obtained in Mount's Bay. This bird at times is not uncommon with us, but it generally appears in its dark sooty plumage, with ferruginous edgings to the scapularies and dorsal feathers, indicating immaturity. There is nothing remarkable in the rest of the plumage of the present specimen, except that the whole of the upper parts are unusually dark, and there is no sign of the filamental yellow feathers on the sides of the neck, which I believe are found always in the mature-plumaged birds.—EDWARD HEARLE RODD (Penzance).

GANNETS OFF THE CORNISH COAST.—In our western seas there has been an unusual number of Gannets this winter, and they have extended in many instances inland, apparently in a state of destitution. This is probably owing to the disturbed state of the sea, arising from a succession of westerly winds, which has rippled the surface and prevented fish from being seen except on the very surface. Gannets not being submarine hunters have fallen short of food, as they had nothing to pounce upon. If I were inclined to collect a series of birds in different stages of plumage, from the immature to the adult state, I should have a good opportunity of doing so now, for I observed lots of specimens at Mr. Vingoe's laboratory just now in all stages of parti-coloured plumage.—ID.

ICELAND AND GLAUCOUS GULLS AT THE LAND'S END.—Early in March I had occasion to examine a stuffed specimen of what I have no doubt is the Iceland Gull, which had been recently killed somewhere in the Land's End waters; but at first sight on looking at the bird I was never more puzzled in determining whether it was the Glaucous or Iceland Gull. It is an unusually large specimen, and I suppose it is in fact a very fine male bird, but its general appearance gives one the idea of its being an under-sized Glaucous Gull. To give a notion of its size from dimensions I may state that I made the length from the carpal joint to the end of the wing (which exceeds the tail by two inches) eighteen inches, but perhaps Mr. Vingoe may be more correct in putting it at seventeen inches and a

half. A specimen in the same state of plumage, obtained here some years since by the late Mr. D. W. Mitchell, measured fifteen inches and a half from the carpal joint to the end of the wing. Some of your readers might very properly remark that from my description this specimen might as well be a small Glaucous as a large Iceland Gull, but I think the length of the quill-feathers beyond the tail shows its character against the Glaucous Gull. It will, however, be necessary to be cautious in dealing with this point—viz., the length of the quill-feathers of this bird, as mentioned by authors. The quill-feathers of the Glaucous Gull are spoken of by most of our authors as scarcely equaling the tail-feathers in length: this, however, is a mistake, for in my specimen, and in one in Mr. Vingoe's possession, the feathers exceed the tail, slightly certainly, but by an inch at least. In Mr. Gould's figure of the Glaucous Gull, in his 'Birds of Great Britain,' I see he makes the length of the quill-feathers exceed the tail, in accordance with the two specimens I have mentioned.—E. H. RODD (Penzance).

CURIOS EFFECT OF THE RECENT FLOODS.—During the month of January last one or two Kingfishers were picked up dead in the water, close to the Vicarage, apparently from starvation, the flood rendering it impossible for them to find their usual sustenance. I may add that these birds have been unusually plentiful in the neighbourhood this winter, and very tame.—ARTHUR P. MORRES (Britford Vicarage, Salisbury).

KING DUCK IN ORKNEY.—On the 31st January last I was out shooting in the String of Shapinsha, and came across a solitary specimen of the King Duck (*Somateria spectabilis*); which I bagged. It was an adult male bird, and I have sent it to be preserved by Ward, of Vere Street, London. The man from whom we hired the boat, and who accompanied us, said that although he had been in the habit of shooting and fishing about the islands for years he had never seen one before.—R. P. HARPER (2, Royal Crescent, Scarborough).

THE "CURLEW" OF THE WILTSHIRE DOWNS.—With reference to the remarks which appeared in the January number of 'The Zoologist' on the supposed breeding of the Common Curlew (*Numenius arquata*) on the Wiltshire Downs, as mentioned in the Appendix to the 'Birds of Marlborough,' it may interest you to know that I have made some enquiries on the subject. Marsh, a labouring man, one of the two Marlborough men who took the eggs and captured an old Curlew, on being shown a stuffed Stone Curlew (*Oedicnemus crepitans*), immediately identified the bird which he had taken with that species, and when shown the head and wings of the Common Curlew said he had never seen a bird like that before. The only authority, therefore, for the breeding of the Common Curlew near Marlborough is now the list published some fifteen years ago in the 'Flora of Marlborough,' and as only one specimen of this bird has ever been recorded to have been taken near here, there can be little doubt that the species

found nesting was the Stone Curlew, or Thick-knee.—T. GRAHAM BALFOUR (Cotton House, Marlborough).

PILOT-FISH AND GRAY MULLET.—On February 14th a Pilot-fish (*Gasterosteus ductor*) was taken in a herring-net off Plymouth, and on the 26th of that month an immense shoal of Gray Mullet was captured when the water was pumped out of the "graving" or dry dock of the Great Western Docks, Plymouth. This shoal consisted of many thousand fish, which were sold for the large sum of £215 for the Paris market. A large number of these fish measured nearly twenty inches in length, and weighed four or five pounds each, many of them much more.—JOHN GATCOMBE (8, Lower Durnford Street, Stonehouse, Plymouth).

ANGULAR CRAB NEAR FALMOUTH.—I have lately received a specimen of the Angular Crab (*Gonoplaax angulata*) captured in Veryan Bay, near Falmouth.—THOMAS CORNISH (Penzance).

[This Crab has been frequently taken on the South coast of England and on the Irish coast, but does not appear to have been met with on the eastern seaboard or in Scotland.—ED.]

UNUSUAL HIDING-PLACE FOR FROGS.—One of my farmers, who is very observant in matters of Natural History, told me that about a month ago, on taking in a straw-rick, he had found a party of five or six frogs all comfortably nestled together on the very apex of the rick, which was some fifteen or sixteen feet high, and that he had found them in the same kind of place more than once. This says a good deal for the frog's power of climbing, for the straw having been ricked as it came only from the threshing machine, they could not have been carried up in it inadvertently. I did not know before they had such a claim to be ranked amongst the Scansores.—ARTHUR P. MORRES (Britford Vicarage, Salisbury).

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

February 18, 1877.—Prof. ALLMAN, F.R.S., President, in the chair.

Messrs. William Burns, E. T. Gardner, J. W. S. Micklejohn, Professor W. W. Harrington of Michigan, U.S., the Rev. John Stubbs, and Sir Charles W. Strickland, Bart., were elected Fellows at this meeting.

Mr. Arthur Lister exhibited under the microscope a most interesting example of the plasmodium of one of the lowly-organized *Myxomyctea*. This common mass of protoplasm well illustrated the peculiar amoeboid movements, and the object gave rise to an animated conversational discussion as to its oft-contested animal or vegetable nature. Professor Haeckel evades this knotty point by provisionally grouping it along with certain other doubtful organisms in his kingdom *Prostita*.

The Secretary read a short communication—"Note on a new example of the Phyllodocidae (*Anaitis rosea*)," by Dr. W. C. McIntosh. This marine worm was obtained at St. Andrew's last autumn, at the margin of low water, and sunk several inches in the fine sand. In the genus *Anaitis* the buccal segment carries the first three pairs of tentacular cirri, the fourth being on the segment behind. *A. rosea* measures about one inch and a half long, the body being relatively broad to its length; the snout is blunt, and the eyes small and circular. The head and tentacles are pale, but in front of the eyes, and partly along segments behind, are roseate bands and speckles, continuing backwards in a bright yellow band, thus resembling certain of the Nemerteans.

The Secretary likewise read a paper "On certain New Forms of *Actinaria* dredged in the Deep Sea from on board H.M.S. 'Challenger'; with a Description also of certain Pelagic Surface-swimming Species," by H. N. Moseley, M.A., late Naturalist to the Government Circumnavigating Expedition. A small part only of what were obtained are accounted for in the present paper, occasional rough weather and other circumstances often preventing immediate attention and descriptions of the animals while fresh. Those now delineated and described are as follows:—

Family *Actiniidae*. Subfam. *Minyadinae*—(1) *Nautactis purpureus* n. sp.; (2) Larval minyad; (3) *Oceanactis rhododactylis*, n. gen. Subfam. *Actininae*—(1) *Actinia abyssicola*, n. sp.; (2) *A. gelatinosa*; (3) *Edwardsia coriacea*, n. sp.; (4) *Corallimorphus profundus*, n. gen.; (5) *C. rigidus*, n. sp.

Family *Cerianthidae*—(1) *Cerianthus bathymetricus*, n. sp.

The occurrence in the deep sea of representatives of shallow water forms of sea anemones is of high interest. For example, the above species of *Edwardsia* from 600 fathoms has undergone but a trifling modification from the littoral form. The *Cerianthus* from 2750 is dwarfed, but uncommonly like its shore brethren; moreover, under the full glare of the tropical sun in shallow water at the Philippines, one kind is found, another species of the same genus existing at three miles depth, where solar rays do not penetrate, and the water is at freezing-point. The fact of the deep sea anemones retaining vivid colouring in their dark watery abode is a point of special value connected with other generalizations. The genus *Corallimorphus* possesses interest as being a near ally to certain of the simple discoid corals, and it has besides the largest nematocysts yet recorded.

An extract from a letter from Mr. R. D. Fitzgerald, of Sydney, New South Wales, relative to the Marsupial Pouch, was briefly adverted to.

Two botanical papers were read;—"On the Rootstock of *Marattia fraxinea*, Sm.," by John Buchanan; and "On Algae collected by Dr. I. Bailey Balfour at Rodriguez during the Transit of Venus Expedition, 1874," by Professor Dickie.

March 1, 1877.—Prof. ALLMAN, F.R.S., President, in the chair.

Mr. Robert Gillies (of Dunedin, Otago, New Zealand), Mr. Herbert Goss (The Avenue, Surbiton), Dr. Albert Günther, F.R.S. (British Museum), and Mr. Matthew Moggridge (8, Bira Gardens, South Kensington) were elected Fellows; and Mr. W. C. Cooke (2, Grosvenor Villas, Junction Road, Holloway, N.)—well known for his researches on Fungi—was elected an Associate of the Society.

The only zoological paper read at this meeting was one by Mr. Edgar A. Smith, *viz.*, "Description of a new Form of *Ophiuridae*." The specimen in question was collected by the late Mr. Cuming in the Philippines between thirty and forty years ago, and was deposited in the British Museum, where its peculiarities seemed to have escaped notice until recently, when comparison with other later additions from a neighbouring locality directed attention to it. This remarkable species partakes more of the character of the genus *Ophiomastix* than of any other. The soft skin covered with minute scales, the mouth-organs, and the character of the arm-plates and upper series of spines agree precisely with those of that genus; but the absence of tentacle-scales is perhaps sufficient to separate it subgenerically. The author has therefore named it *Acantharachna mirabilis*, the subgeneric name being suggested by its fancied resemblance to a thorny-legged spider.

A highly important communication, "On the Flora of Morocco," was read by Mr. John Ball, F.R.S. (Pres. Alpine Club), special attention being called to the fact that, although but a few days' sail from London, the fauna and flora of that country are comparatively unknown to Europeans. Much remains to be done, but considerable difficulty attends exploration, especially in the mountainous districts, from the strong opposition of the inhabitants, descendants of the once warlike and fierce Berbers.

Mr. J. G. Baker gave the gist of his researches "On the Angolan *Liliaceæ*," as represented in the valuable herbarium of the late Dr. Welwitsch, the proportion of new species being very great; Mr. W. P. Hiern exhibited and made remarks on the embryo of *Embryopteris*, Gaert.; and Dr. Maxwell Masters brought before the meeting a series of specimens illustrative of what is commonly known as "burrs" or "witch-knots." These examples were collected by Mr. Webster, gardener to the Duke of Richmond and Gordon, from the neighbourhood of Banff Castle; and their nature and cause of production formed the subject of an interesting discussion.

March 15, 1877.—Prof. ALLMAN, F.R.S., President, in the chair.

The Rev. R. Gardner Smith, of Manningham, Bradford, and Mr. Alexander Young Stewart, Superintendent of the Apothecaries' Hall, were elected Fellows of the Society.

The Secretary read a paper forwarded by the Rev. Thomas Powell, missionary, resident in the Navigator's Islands, "On the Poisoned Spears

and Arrows of the Samoan Islanders." The attention of the author had been called to this subject by the death of the late Commander Goodenough, R.N., said to have been caused by one of these weapons. His chief information has been derived from the son of a native chief. These arrows, it is said, are pointed with human bones, and in some instances with the spines of a large species of *Echimus*. The gummy product of several trees is used, and, besides being dipped in this, there is added a substance from wasp's nests and putrid liquid of the sea-cucumber (*Holothuria*). A kind of kiln is then prepared where the arrows are smoked, afterwards inserted into the dried flower of a species of *Zacca*, to prevent humidity, and tied up in bundles ready for use. Mr. Powell then noted the effects of the poison on the human system and the reputed means of cure.

Dr. A. Günther gave a "Notice of two large Extinct Lizards formerly inhabiting the Mascarene Islands." The fragmentary materials yielding evidence of these creatures had partly been obtained by Mr. Edward Newton, already well known for his acquaintance with the extinct fauna of the Maccarenes, and partly by Mr. H. H. Slater, one of the naturalists accompanying the Transit of Venus Expedition. The bones of one lizard must have been that of an animal above a foot long, not including the tail. As far as can be made out its nearest congeners were the *Zonuridae* and *Scineidae*, but nevertheless so far characteristically different as to be considered worthy of generic distinction, the name *Didosaurus mauritianus* being given it. The remains of another form from Rodriguez point to its being closely allied to the Geckos, although larger than *G. verus*: the name *G. Newtonii* has been assigned to it.

The second part of "Contributions to the Ornithology of New Guinea," by Mr. R. Bowdler Sharpe, was, in his absence, read by Mr. Howard Saunders. This paper contained an account of a collection of birds formed by Dr. James, a young and enthusiastic naturalist who was unfortunately murdered by the natives during an expedition to one of the islands in Hall's Sound, whither he had gone to collect Birds of Paradise. He collected in Yule Island and on the opposite coast of South-Eastern New Guinea. The collection contains fifty-three species, of which three appear to be new to science. The great bulk of the birds obtained were well-known Australian or Aru Island forms; and thus it becomes evident that the south-eastern corner of New Guinea cannot compare with the northern portion of the island as regards the species exclusively indigenous to the country. The new species are *Melidora collaris*, *Thomygama Jamesii*, and a long-tailed Kingfisher (*Tanysiptera microrhyncha*). The most interesting addition, however, is that of *Machaeramphus alcinus*, a night-flying black Kite, at present only known from the peninsula of Malacca and Southern Tenasserim, to which localities it was hitherto believed to be peculiar. As

yet only four specimens of this rare bird of prey are known to exist, *viz.*, the type in the Leyden Museum, one in Mr. Hume's collection in India, one in the possession of the Marquis of Tweeddale, and one in the British Museum, presented last year by Captain Stackhouse Pinwell.

ZOOLOGICAL SOCIETY OF LONDON.

February 20, 1877.—Prof. FLOWER, F.R.S., Vice-President, in the chair.

A communication was read from Professor Owen, C.B., containing some additional evidence recently obtained of the former existence in South Australia of extinct birds allied to the genus *Dromornis*.

Mr. Osbert Salvin exhibited a series of drawings made during Hunter's voyage to Australia in 1788—92, wherein Duke of York Island as it then existed was depicted, together with various objects of Natural History, and offered some remarks on the geographical position and climate of this island, by way of preface to a series of papers by different authors on a collection of mammals, birds, reptiles, fishes, and insects sent home by the Rev. George Brown from the island in question and the neighbouring parts of New Ireland and New Britain.

Mr. Sclater read a paper on the birds in this collection, and described eleven species as new to Science, amongst which were a new Kingfisher, proposed to be called *Tanysiptera nigriceps*, and a new Pigeon, to which the name *Macropygia Browni* was assigned.

Dr. G. E. Dobson enumerated the Bats collected, amongst which four were considered to belong to undescribed species, and one of these to a new genus of the frugivorous Bats, proposed to be called *Melonycteris*.

Mr. Edward R. Alston dealt with the Rodents and Marsupials in this collection, and pointed out that the species, six in number, were either identical with New Guinea forms or nearly allied. For three new species the names of *Mus Browni*, *Uromys rufescens*, and *Macropus lugens* were proposed.

Messrs. O. Salvin and F. Du Cane Godman described the Lepidoptera, and found that the series of butterflies contained twenty-six genera and forty species, while in that of the moths eleven genera were represented by fourteen species.

Mr. E. J. Miers enumerated the Crustacea, and stated that the collection, with one exception (*Lysiosquilla arenaria*), belonged to the Decapoda, and contained in all forty-four specimens representing sixteen species. Although none of the species were new to Science, several were interesting and little-known forms.

Dr. A. Günther read a paper on the Reptiles and Fishes in this collection. Of nine lizards, one was described as new, and of eleven snakes three were

considered to be hitherto unknown. Amongst the latter was a new genus and species of *Eryadae*, proposed to be called *Erabophis asper*.

Mr. H. W. Bates gave an account of the Coleoptera collected, and remarked that the collection comprised forty-four species, and contained some of the finest species of the New Guinea fauna. Amongst these were many examples of a new Longicorn, proposed to be called *Batocera Browni*, after its discoverer.

March 6, 1877.—Dr. E. HAMILTON, Vice President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of February, and called particular attention to a Mexican Eared Owl (*Asio mexicanus*), purchased of a dealer in Liverpool, and said to have been received from Para, being the first example of this very well-marked species of Eared Owl which had been received alive, and a Rhea, purchased along with the above-mentioned Owl, which appeared to belong to the species distinguished in 1860 as *Rhea macrorhyncha* (Trans. Zool. Soc. iv., p. 356, pl. Ixix.), from an example then living in the Society's Gardens.

Mr. E. W. H. Holdsworth exhibited and made remarks on a rare bird received from Ceylon, *Geocichla Layardi*.

Professor Owen communicated some notes made by Mr. G. F. Bennett, while exploring the burrows of the *Ornithorhynchus paradoxus*, in Queensland, with comments on them.

A communication was read from Lieut-Col. R. H. Beddome, containing the descriptions of three new snakes of the family *Uropeltidae*, from Southern India.

Mr. A. G. Butler read the descriptions of some new species of Heterocerous Lepidoptera in the collection of the British Museum, from Madagascar and Borneo. Amongst the latter was the type of a new genus, proposed to be called *Mimeoplæa*.

Mr. G. French Angas read a paper in which he gave descriptions of a new species of *Bulimus* from Western Australia, and a *Paludinella* from Lake Eyre, South Australia; these he proposed to call respectively *Bulimus Ponsonbyi* and *Paludinella Gilesi*.

A second paper by Mr. Angas contained the descriptions of one genus and twenty-five species of marine shells from New South Wales.

Mr. Angas also read a further list of additional species of marine Mollusca to be included in the fauna of Port Jackson and the adjacent coasts of New South Wales, with remarks on their exact localities, &c., thus bringing up the number of species now ascertained to inhabit Port Jackson and the adjoining shores to a gross total of 693.

Mr. Phineas S. Abraham read a paper containing a revision of the Anthobranchiate Nudibranchiate Mollusca. The paper comprised a

general and historical introduction to this group of Nudibranchs, *i. e.*, those which bear the branchiæ upon the dorsal surface, more or less surrounding the arms, and allusion was made to all the observations which had been made upon these animals. The second part consisted of definitions of the larger divisions and of the genera, with the enumeration, synonyms, and habitats, as far as possible, of every species hitherto recorded. In the last general list, *viz.*, that by H. and A. Adams, but 163 forms were mentioned; this list included 457. The third part contained descriptions of forty-one hitherto undescribed species belonging to the genera *Doris*, *Chromodoris*, *Hexabranchus*, *Acanthodoris*, and *Doridopsis*.

A communication was read from the Count Salvadori, containing notes on some birds mentioned by Dr. Cabanis and Mr. Reichenow as collected in Papuasia and in the Moluccas during the voyage of the 'Gazelle.'

March 20, 1877.—Dr. E. HAMILTON, Vice-President, in the chair.

Mr. Sclater called the attention of the meeting to an article in 'The Oriental Sporting Magazine' for May, 1876, in which it appeared that a two-horned Rhinoceros had been killed in February, 1876, at a place some twenty miles south of Comillah, in Tipperah. Mr. Sclater said that this was the third recorded occurrence of a two-horned Rhinoceros north of the Bay of Bengal.

Mr. Sclater also called attention to the fact that Mr. W. Jamrach had just imported a young living specimen of the Rhinoceros of the Bengal Sunderbunds, which was either *Rhinoceros sondaicus* or a very closely-allied form.

Mr. Sclater exhibited a small living Amphisbænian (*Blanus cinereus*), which had been accidentally brought to England in the roots of a hot-house plant from Port St. Mary, Spain, and was found at Clapham.

Messrs. Charles G. Danford and Edward R. Alston read a paper on the Mammals of Asia Minor, based principally on collections made by the former in that country. The list included one species of Bat, two of Insectivores, twenty of Carnivores, seven of Ungulates, and fourteen of Rodents. *Spermophilus xanthopygmnus*, Benn., was re-described, and the name *Mus mystacinus* was proposed for a new species of Field Mouse.

Mr. A. G. Butler read a paper on the Myriopoda obtained by the Rev. G. Brown in Duke of York Island. The species sent home were two in number, both of them allied to but distinct from previously described species. Mr. Butler proposed to designate them as *Heterostoma Brownii* and *Spirobolus cinctipes*.

A communication was read from the Rev. O. P. Cambridge, in which he gave the description of some Spiders collected by the Rev. G. Brown in Duke of York Island, New Britain, and New Ireland. Two of these

appeared to be undescribed, and were named *Argiope Brownii* and *Sarotes vulpinus*.

Prof. A. H. Garrod read a paper containing notes on the Anatomy of the Musk Deer (*Moschus moschiferus*).

A communication was read from Mr. Edward Bartlett, containing remarks on the affinities of *Mesites*, a rare Madagascan bird, and the position which it should occupy in a natural classification. From an examination of the structure of the feathers, Mr. Bartlett had come to the conclusion that *Mesites* was an aberrant form of the Ardeine group.

Dr. Günther read a paper containing an account of the Fishes collected by Capt. Feilden during the recent Arctic Expedition. Amongst them were several of great interest, especially a new species of Charr, for which the name *Salmo arcturus* was proposed. This Charr was discovered in fresh-water lakes of Grinnell Land, and was stated to be the most northern fresh-water fish known to exist.

Mr. Edward Newton exhibited and read a paper on a collection of Birds made in the island of Anjuan or Johanna, one of the Cormoro group, by Mr. Bewsher, of Mauritius, whereby the number of species known to have occurred in that island was raised to thirty-five, of which fourteen were first observed there by that gentleman. Five of them—namely, *Zosterops Anjuanensis*, *Tchitrea rufina*, *Ellisia longicaudata*, *Turdus Bewsheri*, and *Turtur comorensis*—were described as new.—*P. L. Sclater.*

ENTOMOLOGICAL SOCIETY OF LONDON.

March 7, 1877.—J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the chair.

Exhibitions, &c.

Mr. Douglas exhibited a specimen of the Longicorn, *Monohammus sutor*, brought to him alive, having been captured in a garden in the Camden Road. Also a melanic variety of *Orthosia suspecta*, taken at Dunkeld.

Mr. Hudd exhibited varieties of British Lepidoptera taken near Bristol and in South Wales. Amongst them were *Sphinx ligustri*, *Lycæna Alexis*, and *Boarmia repandata*, the latter a black variety.

Mr. Champion exhibited specimens of *Cardiophorus rufipes*, a species new to Britain, taken by Mr. J. Dunsmore near Paisley; also a British example of *Aphodius scrofa*, from the collection of Mr. Dunsmore, who unfortunately had no note of its locality.

The Secretary exhibited a specimen of an Isopod Crustacean, which had been forwarded to him by Mr. J. M. Wills, Surgeon S.S. ‘City of Canterbury,’ who stated that it was found occasionally parasitic on the flying fish, and generally close to the pectoral fins.

Mr. Douglas read the following extract from a letter received from Dr. Sahlberg from Helsingfors:—

"As you have already heard, I went on an entomological excursion to Yenisei. My plan was to meet Professor Nordenskjöld at the mouth of the river, and to return per steamer over the Kara Sea. I did not succeed, and therefore had to travel back through Siberia; still I have brought a mass of insects with me from the extreme north of Siberia, especially Coleoptera and Hemiptera, and now I am busy getting them into order. The insect fauna of Arctic Siberia agrees with that of Lapland, and I had the pleasure to find several species which I had formerly discovered in the north of my own country; for example, among Hemiptera, *Platyp-sallus acanthiooides* and *Bathysmatophorus Reuteri*, the last being the most frequent of the *Cicadaria* in the district. In the neighbourhood of the River Yenisei, in places which are yearly flooded there were to be found many species strange to Europe, but not very many new."

"I have just looked through my Siberian collection of Hemiptera-Heteroptera, and as most of these were collected in the extreme north, the lot is rather poor, and consists of less than one hundred species, of which fourteen were new—viz., one *Aradus*, one *Calocoris*, two *Orthotylus*, one *Orthops*, one *Pachytoma*, one *Anthocoris*, one *Acompocoris*, five *Sulda*, one *Corixa*. I am interested most in the *Sulda* species, which were large and fine, and discovered in the extreme North (69° — $70^{\circ} 20'$), in Tundra territory (*extra limites arborum*).

"I have just received the commission from the Nordenskjöld Yenisei Expedition (which consists of four naturalists, amongst whom is Philip Trybom, an entomologist), to work at the collection of Coleoptera and Hemiptera, which, however, is still in Siberia. I shall therefore not publish anything until I have looked through it, although I have the descriptions of the new species ready. Pending the appearance of Fieber's 'European Cicadaria,' I shall begin the Coleoptera."

Paper read.

The Secretary read a paper by Mr. W. L. Distant, "On the Geographical Distribution of *Danais archippus*." The author remarked on the migration of the butterfly from North America (its original home) eastward to Europe and the Azores and westward to the South Sea Islands and Australia, and attributed the "means of dispersal" to "winds, currents, and the agency of man." After the reading of the paper a discussion ensued, in which considerable doubt was expressed as to the probability of insects being conveyed on floating timber by the agency of the Gulf Stream or other currents.—*F. G.*

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A SPRING TOUR IN NORWAY; WITH NOTES ON THE BIRDS OBSERVED THERE.

BY F. S. MITCHELL.

IT was on the 14th May that, in company with my friend Mr. Wrigley and a Norwegian guide and collector named Lysne, I landed at Orkedalsoren (Nervig), on the Trondhjemsfjord, on the way to the Dovrefjeld, where we proposed spending most of our time. We had arrived at Trondhjem in the 'Tasso' from Hull on the morning of the 12th, meeting Lysne the evening of the same day, he having come up by coasting steamer from Lærdal. Losing as little time as possible in getting our money changed, &c., we started off at once for the interior. Our route lay through Orkedal and Meldal, past Grut to Bjærkaker, where we joined the main road from Trondhjem; thence by Austberg to Stuen, and so past Aune, Drivstuen, and Kongsvold to Jerkin and Fokstuen.

The summer was one of the latest for many years, and everything was covered with ice and snow. The only birds to be seen on our landing were large flocks of Ducks, floating, shy and watchful, at the river's mouth, Ringed Plover and Oystercatchers on the links, and Bramblings and Pied Flycatchers in the woods; so that at first, as our time was limited, the prospect was rather gloomy. Things improved, however, and in the Fokstuen valley we had quite enough of sun and of the insects that disported themselves in its rays. Very little was seen of the big game of the country, no Bears, and no Reindeer, although at Jerkin we had a long walk after a herd of six that had been seen to cross the valley

lower down. Wolves, however, were common about this place, and the birch-woods were full of their tracks. One night we had a great chase after a big fellow that had approached the steadings, toiled after him with the rifle about two miles up a hill-side, through knee-deep snow, but only had our labour for our pains, for he wouldn't let us come within shot. A little boy had had one threatening him the day before, on the road a mile or so away from the station, and had much ado to keep it off by shouting and throwing stones; and a friend, whom we met here accidentally, came suddenly on another, snarling and snapping in the middle of a lonely wood. Not being armed with any more trenchant weapon than a walking-stick, he politely retired backwards and stepped into a deep bog, from which he had considerable difficulty in extricating himself. Red Foxes were seen several times by the side of the road.

We had, unfortunately, to leave for home on the 16th of June, and were thus unable to wait for the nesting of many birds, whose eggs we could assuredly have procured but for want of time. Having given ourselves the least possible margin to catch the steamer at Christiania, we had to carriole nearly night and day to Lillehammer, where we took the boat down the Mjösen lake to Eidsvold, the railway terminus. Naturally, under conditions of this sort, there was very little recourse to the note-book.

The following are the notes we made on all the species of birds met with during our tour:—

Golden Eagle. *Aquila chrysaëtus*.—At Grut, in Meldal, we procured an unblown egg of this species, taken the year before from an eyrie in the neighbouring mountains, at which time both birds had been shot for the sake of the half-dollar which is paid by the Government for the destruction of all the larger birds of prey. The man who killed them paid a visit to the place before our departure, but there were no fresh tenants. This he did in the early morning, before anybody was up; we suppose because he was afraid we might cause him to be forestalled in the event of a future occupancy; we could not be vexed with him as he was hardly *compos mente*.

Merlin. *Falco æsalon*.—While I was slung over the cliff after the Rough-legged Buzzard on the Dovre, June 13th, a male Merlin flew past me, the only one observed.

Kestrel. *Falco tinnunculus*.—A nest was taken from a wood

between Fokstuen and Dombaas on the 30th May. It was in a pine, was lined with wool, stuck together with mud, and looked very like the architecture of a Hoodie. There were seven eggs, sat, the hardest a week.

Goshawk. *Astur palumbarius*.—On May 19th, at Grut, we procured five eggs of the above, hard sat. The nest, which was of great size, and had evidently been used for many years,—the new on the top of the old,—was half way up a tall pine, in a thick wood, on low ground, close to the River Orkla: it was composed of sticks, and lined with green pine-tufts, the eggs being laid on scraps of bark on the top of these. The ground round the tree was completely covered with bones, mostly of the various Thrushes. As we approached the old bird got off, and hovered screaming above the wood, where she was soon surrounded by a host of croaking Hoodies; it was amusing to see how they scuttled out of the way whenever she made a feint at them. She allowed us one shot at her, as she made a dash over the nest, but was missed.

Sparrowhawk. *Accipiter nisus*.—We never saw this hawk after landing, but on May 11th, whilst crossing, one alighted on the steamer, quite exhausted, and spent the night perched on the rigging. It would permit approach within arm's length, and could easily have been knocked down with a stick.

Rough-legged Buzzard. *Archibuteo lugopus*.—Saw a pair between Fokstuen and Jerkin, hovering about a big cliff, on June 3. They looked beautiful, floating between us and a bright sun, their white wing-feathers seeming almost transparent. Evidently they were breeding, as their anxious proceedings and the continual uttering of their alarm whistle whenever we went near the place plainly showed; but, to the discredit of our perception, as it turned out, we thought they were only just getting the eggs nicely laid, and so left them for a while. On the 15th, however, we started for the place, with all the available hide-rope in the valley, and whilst one end of this was held at the top of the cliff, I at the other, explored all likely places. There were three or four old nests, and it was some time before the right one was hit upon. Great was the disappointment, and inexcusable the language, when a faint whistle proclaimed young, and there they were, on a platform of sticks—three white downy lumps, with pale yellow legs and bill, the youngest only a day or two out of the shell: this the reward for a stiff, hard climb, the loss of a considerable quantity

of blood from mosquito-bites, and the wearing out of the soles of a remarkably good pair of stockings. Woollen stockings, by-the-bye, are capital things for rock-climbing, don't slip, and have a good grip ; they are only inferior to the skin slippers the Færoe men wear. We shot both old birds, and tried to keep the young alive, but they severally succumbed to carriage- and steamboat-travelling, and the last died just in sight of England.

Eagle Owl. *Bubo ignavus*.—We never observed this ourselves, but at Grut procured two fine skins, the birds having been shot there the year before.

Snowy Owl. *Nyctea scandiaca*.—It was the 17th of May when we arrived at Grut, and during the evening Wrigley, amusing himself by climbing to all the Magpie's nests in the neighbouring trees, came down from one with two large white eggs in his hands, which Lysne, an experienced man on this species, pronounced Snowy Owls. He went into the village to seek for information on the subject, and came back before long with a grin from ear to ear : he had found the man who had put them there, the fellow having come across them, veritable "Snee-uggla," when crossing the mountains the previous year. He had kept them twelve months, and then, thinking he would like to educate some young Owls, put them in the Magpie's nest to be hatched. A skin, too, that we got from a farmer here, when overhauled at home, was found to be stuffed with soil, and so quite rotten. One was heard, at night, when we were at Drivstuen, and here was seen the only live Lemming we came across ; their skeletons were in scores.

Pied Flycatcher. *Muscicapa atricapilla*.—Seen in numbers at Nervig, May 16th, and eggs were given us by Herr Nissen of this place (who showed us much kindness in many ways), taken in Orkedal. None were observed after we had got on the higher ground.

Fieldfare. *Turdus pilaris*.—These were very few in number on our arrival at Nervig, but the migratory bands were continually arriving, and we met them in increasing flocks by the side of the road as we drove into the interior. One spent the evening of May 10th on the steamer, when two days out from Hull. Our first colony of breeding Fieldfares was met with in a wood near Dombaas on June 4th, but a fortnight after this there were many pairs only building. All the wood close to Fokstuen is birch only, and here they bred in large numbers ; but five or six miles

away pine is largely mingled, and where this is so the latter appears to be preferred. The nests were at heights from the ground varying from three to fifteen feet, and the most common number of eggs four, though some had six, and one seven; this last an extraordinary number. One nest was by itself in a low willow bush in the middle of the marsh.

Song Thrush. *Turdus musicus*.—A single nest was taken near Dombaas, June 10th, containing five eggs, hard sat. It was low down in a young pine.

Redwing. *Turdus iliacus*.—We saw very few of this species till we found them nesting on the Dovre, and even then they were in no great numbers. The first nest was discovered May 30th, was low down in a small pine, and contained two eggs. The nests are generally very near the ground; one taken near Jerkin on June 11th was quite so, under a small bush, and contained two young birds and two unhatched eggs; another near Fokstuen, June 7th, was on a stump close to the ground under a bush, and had two eggs, whilst a third, on the same day, was in a young birch, one foot from the ground, with six eggs, about ten days sat. I shot the hen from a nest containing three eggs, which was eight feet high in a birch, a very unusual position; this was on June 4th. The Redwing is very shy and hard to approach, except when it has young; then it is bold enough, and both parents will hop, and flit, and chatter round you as anxious as any birds need be. It would take an old hand to separate a mixed lot of Fieldfares', Redwings', and Blackbirds' nests; they appear to be constructed of exactly the same materials, and to be of the same shape and size.

Ring Ouzel. *Turdus torquatus*.—A male was seen June 8th, in a gully through which a brook ran, near Fokstuen.

Red-spotted Bluethroat. *Cyanecula suecica*.—This bonny little warbler was fairly numerous at Fokstuen, there not being so many at Jerkin, and its sweet and varied song was to be heard every day as we wandered about among the bushes on the edge of the marshes, the performer perched on the highest twig it could find. We were only lucky enough to find one nest, and that quite by chance. We saw it when building, and thought it was a Titlark's, but accidentally looking at it as we passed a few days after were agreeably surprised to find two of the well-known eggs of the Blue-throat in. It was deep, and made of dried grass, lined with

finer bits, and was in the side of one of a great number of small bush-covered mounds, lying near together in quite a dry place. At first it was easy to see, but as more eggs were laid it was carefully and effectually concealed by matting the grass all round it. We took it on June 11th, when it had six eggs, as we were going to Jerkin for a few days, and were afraid to leave it for the chance of another egg. The old bird was a great skulker; we tried a surprise many times, but could never catch a glimpse of her, and only heard her once.

Redstart. *Ruticilla phoenicura*.—Wrigley took the first nest on June 12th, from a hole in a birch-tree near Jerkin; there were seven fresh eggs. The day the Buzzard was taken, June 15th, I was completely deceived, when, scrambling through the birch-wood, a little bird started from under my feet, and popped away with a flirt of a red tail: hurrah, a Blue-throat! excited search, and grand discovery of five blue eggs in a feather-lined nest under a tree-root. Melancholic remembrance that more birds than Blue-throats have red tails. From a hole in a tree one day I extracted a dead mouse with a Redstart's egg sticking to it; retribution would appear to have overtaken a robber here.

Whinchat. *Pratincola rubetra*.—Only one observed, and that a male, shot between Fokstuen and Dombaas, May 31st.

Wheatear. *Saxicola oenanthe*.—First seen at Fokstuen, May 30th. Numbers frequented the low hills round about.

Willow Warbler. *Phylloscopus trochilus*.—Only one was observed: shot on Fokstuen Marsh, June 4th.

Northern Marsh Titmouse. *Parus borealis*.—A nest of this species was taken in the middle of a thick pine-wood at Grut on May 15th. A small round hole was bored in a rotten tree-stump about four feet from the ground, and six fresh eggs lay about six inches deep in the interior. The nest was made of thin strips of bark, and the eggs, as is the custom with many of the Tits, notably *P. major*, were covered.

White Wagtail. *Motacilla alba*.—Seen about all the villages and station-houses from Nervig onwards, but either they had not begun to build or we couldn't find the nests. One nest of five eggs was taken from a crevice in the timbers of Fokstuen station on June 10th. It was composed of hay and moss outside, thickly lined with finer bits of hay and Lemming-fur. Another was stuck on the extreme end of a projecting timber in an old boat-house; it was

found when building, but the old birds saw us about it, and deserted it.

Gray-headed Wagtail. *Motacilla viridis*.—First seen between Fokstuen and Dombaas, May 31st. They did not appear to have commenced breeding before our departure. On June 11th, near Jerkin, we found a nest in process of building, on the banks of a stream, the old birds being about it.

Meadow Pipit. *Anthus pratensis*.—Very numerous on Fokstuen marsh; fresh eggs were taken from June 10th.

Lapland Bunting. *Plectrophanes lapponicus*.—A fine male was shot on Fokstuen marsh on June 9th, but no nest was discovered till the 14th, when four eggs, a few days sat, were obtained. Before the end of the next day two more were found, containing respectively six and seven eggs, all fresh. The nests were in each case formed of dried grass, lined with feathers, and placed in depressions of the ground under small bushes; one of them had all the feathers in the lining from the axillaries and under wing-coverts of Snipe, and looked very pretty. The birds sit very close, and when disturbed run about among the bushes, chirping very vigorously within a few feet of you, the male always appearing almost immediately, and making a duet.

Snow Bunting. *Plectrophanes nivalis*.—On May 26th we crossed the mountains between Kongsvold and Jerkin, the highest point of the road, and here saw our first flock of Snow Buntings; they were very wild, and would not allow of a nearer approach than fifty or sixty yards. Some were shot on the 28th at Fokstuen, but the snow now began rapidly to disappear from the hills, and none were seen after June 2nd, though we several times visited the tops of the highest hills within several miles in search of them.

Reed Bunting. *Emberiza schœniclus*.—Plentiful on Fokstuen marsh. A nest with four eggs was taken on June 15th from the ground under a bush. It was made of straws and lined with hair.

Brambling. *Fringilla montifringilla*.—Was seen on our arrival at Nervig, May 14th, where they were in pretty numerous flocks. Its curious note (which the Starling imitates to a nicety) had accompanied us all along the road, and it was with great pleasure that we heard this exchanged for the sweet song with which the male serenades his mate as she sits occupied with her motherly duties. The first nest was taken on June 6th, and in the week following a considerable number were discovered. These

are usually placed in the birch trees at heights of from four to eight feet, and the number of eggs never more than four. They are composed mostly of fine straws and bents, mixed with moss and lichen, a layer of still finer bents being put in as lining, over which is a final layer of feathers.

House Sparrow. *Passer domesticus*.—A few were seen about the station at Aarlivold as we passed through on May 17th, and several old nests were stuck among the timbers, but this was the only place we noticed it north of the Dovrefjeld.

Hooded Crow. *Corvus cornix*.—These were very numerous at Nervig, feeding on the enclosed land, as a lot of Rooks might do, and one nest was taken on May 16th by Wrigley, there being four eggs, a little sat upon, in a small tree on an island at the mouth of the River Orkla. We found them as far as Drivstuen, but never saw them on the Dovrefjeld.

Magpie. *Pica caudata*.—Common everywhere; numbers of nests in the trees along the streets of Trondhjem, and close to boxes placed for the reception of Starlings. At Nervig was one within three yards of the ground, and at Jerkin we noticed one built among a heap of sticks reared against the barn-wall. At the former place, on May 14th, we took a nest of seven eggs, and there were many more nearly as far advanced. A nest near Fokstuen station-house was about eight feet from the ground in a small birch, and whilst in process of building was quite inaccessible from the melting snow forming a swampy lake round it, but when all this went it was left high and dry, and we visited it every morning to remove the newly-laid egg. She deposited seven, the last on June 10th, but would do no more for the furtherance of oological science.

Jay. *Garrulus glandarius*.—Two pairs seen at Grut, May 18th, the only ones observed.

Siberian Jay. *Perisoreus infaustus*.—When driving through the thick pine-woods between Austberg and Stuen, May 20th, a Siberian Jay crossed the road in front of us, but the guns happening to be packed up she went on her way rejoicing.

Great Black Woodpecker. *Dryocopus martius*.—On May 21st we had not left the station-house at Stuen above ten minutes when in a tall pine we descried a big hole, evidently the work of a Woodpecker. Two of us went back for a ladder, and whilst carrying this to the place the gun went off, and on our arrival Wrigley

triumphantly pointed out a Great Black Woodpecker, shot just at the hole, and still clinging to the bark with its claws. It was the male, and its mouth and throat were found to be crammed full of ants; the latter being distended with them gave it a very grotesque appearance. The hole was about twenty feet from the ground, square at the bottom, but concave at the top, and about four inches across. About twenty-two inches deep were four well-grown young, which would probably have been flying in a couple of weeks. Two of them had incipient red feathers down to the base of the bill, and two with them only on the occiput, so the sexes were probably divided. The female was shot in the evening, as she tarried disconsolately near the place. The irides are a pale yellow. At Grut we procured the skin of a female killed there last season, and in a thick birch-branch near Fokstuen, on June 7th, we found a hole evidently, by its peculiar shape, dug out by this species, the other Woodpeckers all drilling a round one.

Green Woodpecker. *Gecinus viridis*.—Not fifty yards from the tree last described we saw a round hole, about thirty feet from the ground, in another big pine. The ladder was fetched, but unfortunately was too short; however, it was reared straight up against the tree, fastened firmly round the trunk at the top, so as not to slip, and mounted by the writer, who, having wedged his legs in the topmost rungs, commenced the operation of enlargement with hammer and chisel. The position was so awkward that, to get through the one inch and a half of sound wood and the two inches of rotten, took above two hours' hard work, but the seven fresh eggs laid on the bare wood inside, eighteen inches below the hole, were sufficient compensation for cramped legs and half-broken back. Whilst this was going on, first the female and then the male Green Woodpecker came jarring to the top of a neighbouring tree, and were both shot. The irides were pinkish.

Great Spotted Woodpecker. *Picus major*.—Two were seen in the same wood in which we got the Goshawk, and on the same day, May 19th.

Lesser Spotted Woodpecker. *Picus minor*.—Not observed till we reached Fokstuen, where several were shot in the early part of June. On the 6th a nest of four eggs was taken from a hole in a small birch; they were quite fresh.

Three-toed Woodpecker. *Picoides tridactylus*.—A male was shot on June 6th in the birch-wood near Fokstuen.

Cuckoo. *Cuculus canorus*.—First heard at Jerkin, May 27th; a few remained about Fokstuen till our departure.

Swallow. *Hirundo rustica*.—One seen at Drivstuen on May 25th; the first and only one north of the Dovrefjeld.

Martin. *Chelidon urbica*.—None seen till we arrived at Jerkin, where on May 27th they commenced to build. On the 28th, when we arrived at Fokstuen, they were also building under the eaves of the station-house, but there were no eggs at the date of our departure.

Capercaillie. *Tetrao urogallus*.—Wandering about on May 18th, at Grut, without the guns, we came across the only ones we saw, a male and two females, perched in a thick clump of pines; there was a tremendous clatter when they took to flight.

Black Grouse. *Tetrao tetrix*.—Never saw but one, and that a male, near Nervig, on May 15th.

Common Ptarmigan. *Lagopus mutus*.—Very few seen, compared with that next described. The last was shot at Fokstuen, May 29th, a male, the birch-wood being still deep with snow.

Willow Ptarmigan. *Lagopus albus*.—Very numerous in the Fokstuen valley, though none were observed till our arrival there. The first was shot May 29th, and all killed after this were in full breeding plumage, except a male on June 7th, which had a still white breast, and a number of white feathers on its back. A nest of six eggs was brought in by a boy on the 14th.

Golden Plover. *Charadrius pluvialis*.—A flock of about forty seen at Drivstuen, May 22nd, and very numerous about Jerkin on the 26th, all with full black breasts. The second week in June there were several pairs on the hills about Fokstuen, nesting, without doubt, but we had no time to spare for them.

Dotterel. *Endromias morinellus*.—There were not many flocks of Golden Plover at Jerkin and Fokstuen but had one or more Dotterel among them, and they could be seen any day on the enclosed land near the station-houses. A single pair were seen together on May 30th, between the latter place and Dombaas, but we had other birds then to look after.

Ringed Plover. *Aegialitis hiaticula*.—Numerous at Nervig, on the links at the mouth of the Orkla, in full breeding plumage, but not seen after our departure thence on May 17th.

Oyster-catcher. *Hæmatopus ostralegus*.—The remarks on the species last described might be re-written for this.

Crane. *Grus communis*.—On coming in to one of our meals at Fokstuen on June 15th we were told that a Crane (Trauen) had passed over the house: we had a long walk in the direction it had taken, but our eyes were never gladdened by a sight of it.

Common Redshank. *Totanus calidris*.—First observed May 28th between Jerkin and Fokstuen, and on June 8th some half-dozen were seen feeding near one of the pools on the marsh. They did not appear to be very plentiful, and we did not take any eggs ourselves, though on June 14th a boy brought in a nest of three.

Wood Sandpiper. *Totanus glareola*.—This, next to the Snipe, was the commonest species of the waders on the marsh, but somehow or other the nests were difficult to find. We only had the luck to get one, containing two eggs, on the 5th of June. It consisted of a rather deep depression with a few straws at the bottom, and the grass turned round and interwoven a little at the top, and was on a small grassy tussock.

Common Sandpiper. *Totanus hypoleucus*.—Two pairs were seen on the banks of the River Driva at Drivstuen, May 22nd. One of these, being shot at, was only winged, got into the water, and swam away very vigorously out of reach.

Ruff. *Machetes pugnax*.—A male was shot on Fokstuen marsh on June 9th, the ruff and caruncles being fully developed.

Great Snipe. *Scolopax major*.—We did not see this species before June 9th, at Fokstuen, though during the night, at Jerkin, they were often heard. Three nests, each with four eggs, and all about a week sat, were obtained on the 13th, 14th, and 15th of June; they consisted of slight depressions on stumps in open wet places, with a few straws at the bottom.

Common Snipe. *Scolopax gallinago*.—These were exceedingly numerous on the marshes, and scores might be seen and heard drumming away at the same time. The first eggs were procured June 2nd; these were a few days sat, and none that we got during our stay were entirely fresh, always four in number, and the slightest possible nest. In Faroe, in 1872, I took the most elaborate Snipe's nest I ever saw. It was as round as a Blackbird's, and as deep, constructed very neatly of dry bents, and well buried in tall grass; there were four eggs, half-hatched, the date being the 9th of June, and the bird was secured as she limped away with trailing wings.

Broad-billed Sandpiper. *Limicola platyrhyncha*.—On the morning of June 9th we had started from Fokstuen station-house for an exploration of the hills on the other side the marsh, and had not left it half-an-hour when a little Sandpiper that I did not recognise, got up from under my feet, was shot, and, hurrah! —proved to be a Broad-bill! It was at once decided to leave the hills for the marsh, and thither we accordingly went. Before very long four eggs were found, and so one of the prizes we hoped to get was secured. This nest was not on a tump, but a damp, grassy place, in a dry spot almost level with the mud, and consisted of a round, deep hollow filled with dry leaves of the mountain willow, whose brown colour coincided almost exactly with that of the eggs. On the 11th, at another marsh half-way to Jerkin, on which there were no willows, we took four eggs from a nest composed of dry grass simply, and which was a slight depression on a small tump surrounded by water. The colour of these was very much lighter than the first, more like a Dunlin's. Willow-leaves were not invariably used, even where they were plentiful, as was proved by a nest taken on the 14th from Fokstuen, composed solely of straws. Two others had both leaves and straws mixed, and the rest were like the first in this respect. It was curious that those nests lined with leaves contained the darkest eggs, and those with straws the lighter-coloured ones. The number was invariably four, and these were all fresh, or nearly so, in the seven nests we took, between the 9th and 15th. The open spaces of the marsh appeared to be preferred, where it was free from bushes, and the ground very soppy and wet. The birds in all cases were very tame, would not get off the nest till nearly trodden on, alighting only a few yards away, and running about among the tumps with an occasional subdued half-chirp half-whistle. The male is never far away, always ready to join his mate if she leaves the nest. Irides and legs dark brown. During the last week of our stay a lot of our best working ground was spoiled by a party of German gentlemen, who, in passing Fokstuen, announced that they were on their way to the North Cape, but unfortunately took it into their heads to have a little sporting at Jerkin. Every stream was netted, every marsh within several miles shot over, and it was very annoying to find on some cherished tit-bit of bog a lot of empty cartridge-cases scattered about.

Red-necked Phalarope. *Phalaropus hyperboreus*.—Was first seen on May 28th, near Fokstuen, where we afterwards found them in considerable numbers. We tried hard for the nests, but never found one, and doubt if they had begun to lay.

Shoveller. *Spatula clypeata*.—A boy at Fokstuen, June 13th, brought in six eggs, with the down from the nest. Mr. Harvie Brown has courteously examined these, and pronounces them to be of the above species. The average size of the eggs is $2\frac{7}{8} \times 1\frac{2}{6}\frac{9}{4}$ inches.

Teal. *Querquedula crecca*.—Plentiful at Fokstuen. A nest of eight fresh eggs was taken on June 2nd, on marshy ground close to the water, and sheltered a little by a stick arching over. Another, with nine eggs, a few days sat, was taken on the 13th.

Scoter, *Oidemia nigra*; Velvet Scoter, *Oidemia fusca*; Scaup, *Fuligula marila*.—These all appeared on the marsh on June 2nd, in considerable numbers, but no eggs were taken by us. Our German friends, mentioned above, had completely demoralised the ducks.

Long-tailed Duck. *Harelda glacialis*.—One seen flying over Fokstuen early in June, the only individual observed.

Red-breasted Merganser. *Mergus serrator*.—A male was brought to us at Grut on May 19th, shot on the river with a rifle-bullet through its neck.

Black-throated Diver. *Colymbus arcticus*.—A pair were seen on May 28th, whilst driving from Jerkin to Fokstuen, one of the large lakes by the road-side having got the ice away from about one hundred square yards of its surface. They were left alone in the hope that their eggs might be secured, but were never seen again.

Lesser Black-backed Gull. *Larus fuscus*.—One seen on June 8th, flying over the marsh opposite Fokstuen.

ON THE MIGRATION OF BIRDS.

By JOHN CORDEAUX.

IN the last part of the 'Ornithological Miscellany,' under the heading of "Hirundo rustica," Mr. George Dawson Rowley has propounded an original and startling theory on the migration of birds, a theory which reduces the bird itself to little more than a passive agent, and the act of migration to a great mundane law

requiring the exercise of no intelligence or instinct: the so-called migratory impulse being a blind force, like other forces in Nature,—a mere material force impelling the bird forward without any act of will or instinct. To quote Mr. Rowley:—“My idea about finding the way is this; the bird has as much to do with it as a man starting from London to York by the railway. He finds his way, steam conveys him; wind takes the bird. If the steam blows up, the passenger is killed; if the wind changes, the bird dies.” Again, “The bird starts on its journey; after it has set forth it is ruled entirely by circumstances of which wind is the chief . . . As a ship is ruled by the wind, so is the bird. The bird is a sailing ship, the tail is the rudder, and it is governed by the wind; and this is how it finds its way, just as seeds find their way,” *i.e.*, seeds conveyed by ocean currents to distant shores, or from one field to another by the wind.

From Mr. Rowley’s theory I am obliged entirely to dissent; for I am satisfied that birds are not guided by the wind. The migratory instinct, or by whatever name we choose to call it, is not a blind force; it is an actual and wonderful intelligence, an instinct hereditary in the bird itself; an instinct called into play by various causes, food, vicissitudes of climate, sexual love; an instinct which has been in force, handed down through countless generations of birds, slowly modified from time to time by such circumstances as a gradual change of climate, or changes in the distribution of land and water,* but still an instinct mighty and all-sufficient for attaining its special object.

Birds are not mere automata, they are something more than this; we are much too apt to consider them from our own peculiar standpoint; we argue about them, their habits and movements, as we do also about other animals, from our own experience. What

* Before the enclosure and drainage of the Lincolnshire Fens enormous flocks of various wild-fowl visited the east coast every autumn in incredible numbers. At these times we are told a flock of wild ducks was observed passing along from the N. and N.E. into the East Fen in a continuous stream for eight hours together. Since the drainage and reclamation of the Fen lands the wild fowl have practically deserted our coast, the great migratory stream now passing down the opposite coast of Holland, our principal supply of wild fowl coming from that country. In the shallow waters of the Zuyder Zee, during the autumn migration, the sea is sometimes black for many miles with various ducks. Last year, during the first week of November, immense flocks of swan, geese, and ducks passed Heligoland.

man cannot very well do with his boasted intelligence, the bird cannot do, forgetting that there is no analogy to be drawn between the two cases. Where we find a race of creatures adapted for long flights, and which have undoubtedly for an enormous period of time, twice in each year, been accustomed to migrate to and fro across the earth's surface, we may be well satisfied that they must possess in a high degree in their own special organisms the qualifications for the work—qualifications and powers which have altogether been lost or are merely latent in man himself. Mr. Rowley says:—"Those who hold the opinion that birds migrate by instinct should read the convincing chapters on the way Indians travel through unknown forests (Wallace's 'Natural Selection,' p. 206, *et seq.*), which proves that man does not possess instinct, neither can any one find his way in an *unknown* forest. I contend, then, that what man with intelligence is unable to do, birds must fail to accomplish."

Now I repeat that there is no analogy between the two cases, and that even if it can be shown that man cannot find his way in an unknown region, which I very much doubt, it is really no argument against the bird or other animal not being sufficient for the purpose.* Animals do find their way in some extraordinary manner, by a sort of intuitive instinct, which almost seems like a sixth sense. We have repeatedly, in our own experience, met with remarkable instances in domestic animals—cows taken from their calves, mares and horses from their foals or a favourite pasture, also with dogs taken long distances from home, even by rail—finding their way back again by an entirely new route, and across a perfectly *unknown* country. One remarkable case I remember of a young horse and mare swimming a great tidal river, or arm of the sea, several miles in width, to get back to their old quarters, which they succeeded in doing. By what power, instinct or intelligence they accomplished this I am unable to say, certainly not on the same principle as seeds are carried by ocean currents, or blown from field to field. Before setting forth on the migratory journey, birds often collect together in large flocks, the

* Mr. Rowley, I think, has not comprehended Mr. Wallace's remarks, to which he refers in the above passage, so far indeed as I can form an opinion. What Mr. Wallace says of the so-called "instinct" of Indians and other savages in finding their way is that it is the effect of continued observation (aided by inheritance of the faculty) carried on so as to be quite unconsciously exercised. This is really very like the "instinct" of migratory birds.

species and even the sexes keeping distinct: this shows arrangement, a plan, a special course of procedure—a preparation for the great event shortly to come off. That birds too, under certain circumstances, should delay their flight waiting for a more favourable wind, shows a high degree of intelligence.

An experience of more than twenty years close observation of the habits and manners of birds, more particularly in connection with their annual migrations, has led me to the conclusion that they not only possess far more intelligence than we usually give them credit for, but also know how to make the best use of this intelligence. They do not move in a groove, and are not the mere blind subjects of a great mundane law which Mr. Rowley would seem to infer.

It is a well-established fact that the same birds, both during the vernal and autumnal migration, do return in a great number of instances to the same place. The cases indeed recorded are so numerous that I have difficulty in making a selection. The well-known fact of a Wagtail's nest being built year after year in a particular place, and of a Cuckoo laying her eggs in that nest almost year by year, is one instance. Perhaps, however, the most remarkable case is that mentioned by Mr. Stevenson ('Birds of Norfolk,' vol. ii., p. 55), and previously recorded by Mr. Hewitson ('Eggs of British Birds,' vol. i., p. 209), on the authority of Professor Newton, of a pair of Stone Curlews continuing to resort, year after year, to nest in one particular place (though it was entirely changed in character), long after it, and many acres around it, was planted with trees, and had become the centre of a flourishing wood—namely, the Warren Wood of Elveden, near Thetford, which extends over more than three hundred acres.

In Professor Newton's new edition of Yarrell (p. 565, *note*), another curious instance is given in the case of several pairs of the Yellow Wagtail (*Motacilla Raii*) returning year by year to nest in the same haunts, some heathery mounds bordering a stretch of wet meadows on the left bank of the Little Ouse, below Thetford. The whole passage may be commended to the reader's notice.

At the Ashby decoy, Lincolnshire, a particularly marked duck, having a white throat, was known to come in eight winters in succession, and another, a spotted duck, for four or five years. These, and numbers of other cases, which time and space will not

permit me to cite, prove most undoubtedly that birds do return year by year to the same spot.

On the east coast of Lincolnshire the arrivals of various species, during the autumn months of September and October, are so regular that they may be readily tabulated and predicted to a few days. The same phenomena may be observed, and with even greater certainty, at Heligoland during the periods of the vernal and autumnal migrations. No matter how the weather is at each particular periods of arrival, calm or strong, thick or clear, the birds come, and come, too, with marvellous regularity. They are scarce or plentiful as the case may be, for the abundance or scarcity of migrants at any special locality is due more or less to the state of the weather during the period of passage. The most favourable circumstances for birds passing the sea are calm still periods, or a light breeze, dead ahead, or a few points free. A head wind that is not too strong is the very thing birds like best, but failing that, a "beam wind," to use a nautical expression, seems to be the best. A wind on their quarter, or one aft—that is, having to fly before the wind, particularly if strong—is objectionable; it ruffles up their feathers and otherwise impedes their flight, soonest tiring them out. The consequences of unfavourable winds are that the birds alight on the first coast they reach for rest: under favourable circumstances they would have passed forward far overhead and unseen. Just as a man, fatigued by an arduous or difficult journey, pauses to rest on the way, so the birds alight for rest and quiet; within twenty-four hours, however, they are off again, each to its especial goal in forest, field, marsh, or sea-coast—a goal which it was their steady, predetermined, purpose to reach when they first took wing from the lone *tundra*, or ice-girdled shore, in the far-away north. They trusted to no aerial currents to guide or drift them passively towards the sunny south, as seeds in the wash of the equatorial currents to the Hebridean shore, but to their own instinct and intelligence—an instinct which thus far has never failed. According, however, to Mr. Rowley, birds have neither impulse nor instinct: they are purposeless creatures with no will of their own, and the sport of every puff of wind. To carry out, then, this theory we must undoubtedly assign to the winds a far greater constancy than they are usually supposed to have, or than anemometers will justify us in supposing them to possess. The hypothesis is as wild as the wind itself. Nothing, indeed, is

more variable than the wind—nothing more variable than the wind during the vernal and autumnal equinoxes, when birds must migrate—blowing, as it does, from every point of the compass in twenty-four hours. Were the birds' movements mainly dependent on air-currents, and air-currents only, we should rarely—although Mr. Rowley assumes the contrary—have year by year the same phenomena occurring at any given locality on our east coast. The arrival or non-arrival of immigrants being dependent on one of the most variable of causes, the results would also be variable, whereas the contrary is the case.

Wind, I am convinced, except in some very abnormal instances,* as great gales and storms, has little to do with the normal phenomena of migration. All animals and man himself undoubtedly prefer favourable weather for travelling; but although they may delay, they do not put off their travels altogether because wind and weather are unpropitious.

Continuing his subject, Mr. Rowley says there is one thing in common between the migration of the seed and the bird—"once started they do not come back till the journey is finished." Does Mr. Rowley seriously wish it to be inferred that any comparison can be drawn between the two phenomena—the one thing an inert mass, the play of wind and current; the other a living, highly endowed organism. The seed returns not by the same path because it *cannot*, the bird because it *will not*. Birds are occasionally, however, known to turn back in their migratory journey when they find they have made a mistake. Several instances are on record of migrants during the autumn being seen away off the mouth of the Channel and over the Atlantic, apparently migrating in the wrong direction: they are probably such as on dark foggy morning have overshot the mark, and at daylight discovering their error, are making their way to the nearest land.

There is also the case mentioned by Mr. Stevenson ('Birds of Norfolk,' vol. i., p. 413 *et seq.*) of the Red-legged Partridges in Norfolk migrating out to sea and again returning. Had the birds in these instances migrated on Mr. Rowley's theory, and not by their own instinct, they ought to have kept going in a direct line without coming back. In fact, on Mr. Rowley's hypothesis, we

* See 'The Field,' March 11th and 18th, 1876, "On some Abnormal Migrations of Birds."

do not quite see why the bird, once in full migratory swing, should stop again till in the natural course of events it flies itself to death. Compared with the drifting seed, it is positively at a disadvantage, having no sea coast to bring it up : like that marvellous mechanical leg we read of somewhere, which when once wound up and started could not be stopped again, so the bird ought to keep going—aimlessly and purposely, perhaps—but still going.

It is a well-ascertained fact that the young of the year of many birds migrate before their parents, and in separate flocks ; these have never travelled the route before, and how they find their way over these thousands of miles of sea and land seems a very puzzling problem. It is a curious fact that although the young come in separate flocks, we constantly find an old bird or two—usually old females—amongst them, so that the young may to some extent be in leading strings. As most birds, however, travel by night, and on very dark ones too, they cannot trust to guidance alone, and they are not able to make use of such landmarks as prominent capes and headlands. They come much as did the old sea rovers,—without chart or compass, “by rule of thumb,”—certain to hit the land somewhere, and when once the land is seen knowing all will be right. With the wonderful vision birds possess, and the great height at which they usually travel, they would be able, much more readily than we suppose, at early dawn to distinguish known features of land or sea coast (supposing them to have travelled the route before) at, to us, immense distances. Nor would their inherited instinct, I believe, fail under any circumstances, whether in young or old, to bring them to their goal.

As a familiar instance of this inherited instinct in birds we may cite the case of the Common Partridge. How is it, except by this, that Partridges, having had no actual experience for many generations of the real Kite or Buzzard, cower or rush at once to the nearest shelter when the paper kite’s “shadow saileth across the open shaw”? Some years since, when the telegraph-wires were first carried across the Lincolnshire marshes, Partridges and Plover were constantly picked up killed by flying against the wires ; now, after the lapse of some years, this is rarely if ever the case, the generations of Partridges that witnessed this immolation of their comrades has long passed away, yet the present birds have learnt through this same hereditary instinct to avoid the danger.

Instinct is one thing, the migratory impulse another: we must also take into account, when considering the migration of birds, except the very young, the wonderful powers of memory displayed by animals. Those who are accustomed to ride and drive much, must have noticed how rarely a horse forgets any road he has once travelled, or any house he has stopped at, it may be years previously. Out of many instances, I will mention one of this memory in birds. In 'The Zoologist' for 1875, p. 4698, Mr. Nicholls, writing from South Devon, mentions the case of a young Herring Gull taken from the nest in May, 1871, and brought up in a state of domestication. In May, 1872, it left its quarters, and was given up as entirely lost, but, strange to say, in November, 1873, it returned, then in beautiful plumage, and allowed its old friend and playfellow, a little boy of eight years old, to take the same familiarities with it as formerly.

The migratory seasons are undoubtedly the most important periods in the life of a bird: without these regularly recurring periods life would be impossible for them; their existence and the continuation of their race is dependent on these annually recurring voyages through the air. If, then, the instinct has been so strongly and rapidly developed in birds in the case of the paper kite and telegraph-wires, how much stronger may we suppose it to be in guiding the bird along its air-path towards that bourne which countless generations of its kind have sought before.

Enough I think has been said to prove the untenability of this new automaton hypothesis. Indeed, the more it is considered the more absurd does it appear. Nothing short of a miracle would be required to cause a gust of wind to take the same Stone Curlew, in the case above cited (and it is impossible it could have been otherwise than the same bird), year after year, from its winter quarters somewhere in Africa and set it down in its former nesting haunt in what is now the middle of a Suffolk wood.

ON THE OCCURRENCE OF THE SMALLER SOOTY TERN
AT THE MOUTH OF THE THAMES.

BY HOWARD SAUNDERS, F.L.S., F.Z.S.

SOME months ago Mr. E. Bidwell, whose name will be familiar to readers of 'The Zoologist,' and who is unremitting in his researches for rarities in the markets and neighbourhood of London, asked me to examine a specimen of a Tern in the possession of a local birdstuffer, named Barton, residing near the West India Docks. It proved to be an adult example of the Smaller Sooty Tern, *Sterna anaetheta*, Scop., a species not hitherto recorded even as a straggler to the British or indeed to the European coasts, and it bore every appearance of having been recently mounted "from the flesh." Mr. Bidwell subsequently purchased it, and at his request I exhibited it at the meeting of the Zoological Society at Hanover Square on the 6th February, 1877. The following letter, addressed to him by the son of the man from whom he purchased it, contains all the information that has yet been obtained as regards the locality where the specimen was procured:—

"The Tern you purchased of my father was brought to him in the flesh by one of the Trinity-House men who had just returned from duty on board a lightship at the mouth of the Thames in September, 1875. My father skinned the bird and brought it to me to stuff. The skin was perfectly fresh then, and portions of the flesh were adhering to it. I cleaned the skin and set it up."

Mr. Bidwell and I interviewed both father and son on the matter, and there does not seem to be the slightest ground for doubting that the specimen in question really was obtained somewhere at the mouth of the Thames as stated. The man who brought it in returned to his duty, and unless he reads this or revisits either of the Bartons with some other bird "out of the common," we shall probably remain in ignorance as to the precise lightship where the bird was taken, doubtless during the equinoctial gales, as it was obtained in September.

There are at present three known species of the Sooty Tern group, the largest and best known of which is—

STERNA FULIGINOSA, Gm. Syst. Nat., i., p. 605 (1788). Its habitat may be described as intertropical, or at most between

40° N. and 40° S. lat., with the exception of the two or three stragglers which have wandered out of their usual limits as far as our coasts (*vide* Harting's Brit. Birds, p. 169). I can detect no difference amongst the large series I have examined from various localities in the warmer portions of the globe, such as the American coasts and islands, the island of Ascension, the coast of Africa, including the Red Sea, the Polynesian Islands, Australia, and the South of Japan, and the accounts of its habits and nidification seem to agree. Its most noted breeding-place is at Ascension, where the great nesting colony known as "Wide-awake Fair" is one of the few attractions of that huge cinder-heap, and excellent accounts of it have been given by various visitors, the most recent being that by Dr. C. Collingwood (Zool. 2nd ser. p. 979—984), and the late Commander Sperling (Ibis, 1868, pp. 286—288). In all cases the bird seems to sit upon a single egg laid upon the bare ground or amongst the cavities of the lava or coral, according to the locality, making no nest whatever, wherein it differs from the Noddies (*Anous*), and as soon as the duties of incubation are ended and the young can fly, away they all go to sea. Being single-brooded birds, it was natural to suppose that they bred but once in a year, and at tolerably corresponding periods in either hemisphere; still one was continually meeting with immature specimens, whose plumage at the date of their acquisition was not at all what it ought to have been if they had been hatched at the normal periods or at those at which the birds had been found breeding by various explorers. The explanation of this apparent discrepancy was given me by Drs. Drew and Purchas, R.N., who had recently returned from Ascension, and on enquiring of Lieut. Mountjoy Squire, R.N., at present stationed there, the statements of my friends were confirmed, *viz.*, "that the 'Wide-awakes' come up from the sea to breed about every eight months, or three times in two years." Probably this is the case in other breeding-places, but I only know it as a fact of this one, and a very remarkable and interesting fact it is. As regards the plumage of this well-known species, it is hardly necessary to say more than that it is sooty black on the mantle, wings and tail, except outer webs of streamers; white on under parts and neck; black on crown and occiput, with a black streak from base of bill to eye, and a broad white frontal band from extending to a little above the eye, *but not beyond it*; the

feet are webbed to the extremities, and the young are for some time dusky on the under parts. The reason for laying stress on these particulars will be shown in treating of the next species.

STERNA ANÆSTHETA (originally printed *S. anæsthetus*), Scopoli, Deliciae Flora et Faunæ Insubricæ, i. p. 92, No. 72 (1786), ex Sonnerat's Voyages, p. 125, pl. 84, where the species is described as the *Hirondelle de Mer de Panay* (Phillipine Islands), whence it is sometimes called the Panay Tern, *S. panayensis*, Gm. (1788), &c. The range of this species is almost the same as that of its congener, whose example, as we have seen, it has followed in straggling as far as our coast, but the information we possess tends to show that it is rather less oceanic in its habits, and more inclined to hug the shore. In distribution of colour it resembles *S. fuliginosa*, but it is somewhat smaller in size; the mantle and wings are decidedly less sooty, the white from the frontal band extends both *above* and *beyond* the eye, and the *web* between the middle and inner toes only extends to the *last* joint of the latter, and does *not* come down to the claw; the young also are *light* on the *under parts* on emerging from the downy stage. A woodcut of the above differences in the formation of the feet of the two species will be found in my paper on the *Sterninæ* (Proc. Zool. Soc., 1876, p. 665).

The third species of the group is STERNA LUNATA, Peale, U. S. Expl. Exped.—Birds, p. 277 (1848). It is intermediate in size between the other two, has a more distinctly *slate-gray* mantle, and is altogether washed with a grayish tint; the webs of the feet are similarly incised with those of *S. anæsthetia*, to which it is more closely related than to *S. fuliginosa*. Its range, so far as we know it at present, only extends from the Moluccas to the Phenix and Paumatu groups of the Polynesian Islands. I do not know of any specimens in collections in this country, but the Leyden Museum, which is far in advance of our national collection in *Laridæ*, possesses several examples.

The Sooty Terns have been separated generically from the true Terns by Wagler, and as one or other of his generic names have been pretty freely adopted, it may be edifying to consider them for a moment, for they supply an excellent sample of the way in which our scientific nomenclature is encumbered by useless and

confusing subdivisions. First, Wagler took the MS. description, or perhaps even the type specimen, of J. R. Forster's *Sterna serrata*, which he identified, and correctly, with *S. fuliginosa*, but as that individual specimen had a claw somewhat notched and jagged from contact with rocks, he formed for its reception the genus *Onychoprion* (*Isis*, 1832, p. 277), from ὄνυξ, nail, πρίων, a saw. He then took another of Forster's types, named in his MS. *Sterna guttata*, which this time happened to be an example of *S. fuliginosa*, in which the accidental serration above referred to was not observable: here it seemed to him was another *structural* (!) difference, on which he accordingly based the genus *Planetis* (*Isis*, 1832, p. 1222), from πλαντός, wandering. Not yet satisfied, he took a third specimen of *S. fuliginosa*, and, almost on the same page, gave it generic distinction under the name of *Haliplana* (*Isis*, 1832, p. 1224), from ἀλίπλανος, sea-wandering. That was pretty well for one systematist's work with a single species: others have placed the same bird in two other genera besides *Sterna*, but let that pass.

With regard to the propriety of separating the Sooty Terns generically from the other Sea Terns, I would remark that I can find no *structural* difference in the former, their only peculiarity consisting in their coloration,—a distinction insufficient in my opinion for the formation of a genus,—and even in that respect there is a species found at Alaska, *Sterna aleutica*, which, with head markings and mantle similar to those of *S. fuliginosa*, has a white rump and tail, thus forming a connecting link. But although there is no well-defined structural difference between *S. fuliginosa* and the typical Sea Terns, there actually exists a real noticeable structural variation in the formation of the feet of such closely allied-species as *S. fuliginosa* and *S. anæsthetia*—forms which the most persistent genus-maker would hardly venture to place in different genera—yet it is clearly shown that they differ more markedly *inter se* than they do from typical *Sterna*.

Under these circumstances, I would submit it to the judgment of ornithologists whether it is not advisable to disregard Wagler's genera, and to retain the Sooty Terns in the genus *Sterna*.

ON THE ANATOMICAL CHARACTERS DISTINGUISHING
THE SWALLOW AND THE SWIFT.

By A. H. GARROD, M.A., F.R.S.

IT is not a difficult task, whatever the department of the subject which may be under consideration, to classify thinking naturalists in one or other of two divisions, dependent upon the nature of the facts which they, from opportunity or inclination, are in the habit of specially emphasising. There are those who devote themselves to the study of the animal as a whole, its external conformation, its habits, and its haunts. They collect specimens of allied species and preserve them according to an arrangement which is liable to be modified by the experience of collectors generally, and from rumours which reach them as to the results arrived at by those of the class to be referred to immediately. These latter lay but little stress upon superficial resemblance and specific differences, devoting their attention to those facts brought to light by osteological comparison or the differences of deep-seated soft parts, which throw light upon the mutual relations of the larger groups into which the subjects of their study are generally acknowledged to fall.

Now and again the opinions of these two classes of naturalists are apt to be diametrically opposed. The one, as the result of his experience that intimately allied forms closely resemble one another, is apt hastily to draw the illogical conclusion that the converse of the proposition is equally true, and that therefore animals which closely resemble one another in contour and habit must be very nearly related. The other, basing his conclusions on different data, does not run the risk of being misled by the deceptive argument, and forms an opinion which has therefore the average value of his productions.

As an excellent example of the above-mentioned opposed notions of naturalists, the relation of the Swallow to the Swift stands prominently forward. By systematic ornithologists and collectors of birds until recently it has always been the habit to place these birds in juxtaposition, contrary to the opinion of anatomists, just in the same way that the Sand Grouse is grouped by them with the *Tetraonidæ*, the Petrels with the Gulls, and the Secretary Bird with the Caracaras.

Let us look into the subject a little more closely. The common Swift and the common Swallow are birds which intimately resemble one another in many respects. Their size and general coloration are much the same. In both the beak is very broad and short; the first bone of the pointed wing, which corresponds to the human upper arm bone, being also particularly short; whilst the bones of the wing which agree with those of the fore arm—the radius and the ulna—are proportionately very long. In both the feet are small, and the power of progression on the ground feeble, each living almost entirely on the wing, making the smaller insects its staple article of food, and each building its nest in walls or eaves of roofs, not in the branches of trees.

This collection of external resemblances would generally be accepted as sufficient evidence that the Swallow and the Swift are closely allied birds; in other words, that in the pedigree of the bird-class they sprang from a common ancestor, at some, zoologically speaking, comparatively recent time. Further, the fact that the two birds are described next to one another, or placed side by side in collections, by many of those who are in the habit of employing a systematic method of arranging the different genera, would show that such ornithologists consider the relationship between the Swallow and the Swift to be more intimate than that between either of these birds and the Sparrow, Crow, Starling, Lark, &c. But all these last-named birds are what are known as Passerine; in other words, they possess certain anatomical peculiarities in their organization, found in them all, and in no other group of birds. If, therefore, the Swift and the Swallow are more nearly related to one another than either is to any other passerine bird, then, as the Swallow is most certainly passerine, the Swift must be so also.

But certain naturalists assert that the Swift is not a passerine bird at all, and, if they are correct, it is evident that the Swallow and it cannot have anything to do with one another. Upon this assumption, therefore, the passerine Swallow is much more closely related to the Sparrow, the Crow, and the Lark than it is to the Swift.

The question then presents itself—Is it really the case that the importance of the deep-seated anatomical resemblances between the Swallow and the Sparrow, and of the differences between the Swallow and the Swift, is sufficient to justify us, notwithstanding

the external similarity between the last-named birds, in believing that the first-mentioned are truly more intimately related the one to the other?

It may be worth while taking a rapid glance at what some of these most important anatomical resemblances and differences happen to be. One of them is the manner in which the feathers are arranged on the skin. Most of us know that, unlike the hair upon a cat or other quadruped, the feathers of a bird are not uniformly distributed over the surface of the body, but grow in linear clusters called tracts, with naked intervals, termed spaces, between them. This may be readily verified by plucking, say a Sparrow, and noticing the thick and opaque light-coloured bands formed by the thickening of the skin surrounding the holes out of which the feathers have been extracted. Between these tracts the skin is seen to be thin and translucent, forming naked spaces through which the colour of the underlying muscles is apparent.

The careful study, some five and forty years ago, by the eminent German ornithologist, C. L. Nitzsch, led him to the conclusion, among others, that these feather tracts are arranged upon a very different plan in the Swallows to what they are in the Swifts, whilst in the Sparrows and their allies they very closely resemble the Swallows. Further he showed that in this feature the Swifts and the Humming Birds are almost identical.

Again, the breast-bone or sternum in birds is much expanded to give origin to the powerful muscles of flight. In both the Swallow and the Sparrow, as in passerine birds generally, its usually oblong figure is modified by the presence of two deep notches, one on each side of the keel, in the posterior margin. But in the Swift there are no such notches to be found, the posterior margin being entire, and in other respects it differs from the same bone in the *Passeres*, whilst in all it resembles the Humming Birds.

In the Sparrow and the Swallow, again, as in the great majority of the passerine birds, there is at the lower end of the trachea or windpipe, where the bronchi which place it in communication with the lungs arise, an elaborate special mechanism which is known as the muscular organ of voice or lower larynx, by which they have the power—although they do not all employ it—of modulating their note so as to produce a song: this is not found in the Swifts.

In man the greater part of the alimentary canal is composed of a tube of small diameter—the small intestine—which is continued onwards as a more capacious one, the large intestine. These two are not simple continuations one of the other, but the former enters the latter obliquely, the nearer end of the large intestine remaining free as the “blind gut” or cœcum. In the Swallow and Sparrow, as in all the *Passeres*, instead of there being a single cœcum at the place of junction of the two intestines, there are two. These are not found in the Swifts, nor in the Humming Birds.

In the Swallow, the Sparrow, and all their true allies, it is always the case that the tendons which contract up the last joints of the toes are so arranged that the birds have the power of folding the toe which corresponds to our great toe (the one directed backwards) without moving any of the others. In the Swift, however, whenever the great toe (the hallux) is fully flexed, it is impossible that the other toes should remain opened out, because the two muscles which act on one and the other are bound together by a tendonous band.

In the Swallow, the Sparrow, and most singing birds the number of feathers in the tail is twelve. In the Swifts and Humming Birds the number is always ten—another important difference.

In the Swallow also, as in all the passerine birds, there is a slender muscle running through the thin triangular membrane of the wing between the arm and the fore arm, which is quite peculiar in the manner of insertion or attachment, no other birds possessing the same arrangement. In the Swift this muscle terminates in quite a different manner, here again resembling the Humming Birds exactly.

Taking these several characters into consideration, and realizing how little they are susceptible, on account of their deep-seatedness, to the influence of slight external changes in the mode of life of the species, we are inevitably driven to the conclusion that their weight is overwhelmingly greater than that of the superficial similarity which is so readily brought about by the similarity of the circumstances under which the two species are accustomed to live, and that the resemblances between them are, so far as their constitutions are concerned, dependent only on the fact that they both have—with different pedigrees—arrived at a superficial similarity in contour because they subsist exclusively on the same food.

ON THE OCCURRENCE OF THE CENTRINE SHARK
OFF THE COAST OF CORNWALL.

By THOMAS CORNISH.

I HAVE recently obtained from a trawler a specimen of the Centrine Shark (*Squalis centrina*), the first, so far as I can ascertain, taken in English Seas. It was trawled up from a sandy bottom in twenty-six fathom water near the Wolf Lighthouse. It is at all events so rare a fish that I feel justified in giving you some account of it.

The feature which at once distinguishes the fish from all other sharks which I have seen is the presence within the skin and through the centre of the two dorsal fins of a stout spine, the end of which projects beyond the fin. The spine of the first dorsal starts from the base of the horizontal middle of the fin and inclines forward; the spine of the second dorsal starts from about the same relative position and inclines backward; so that each fin is a complete spritsail with the sprit rigged.

The length of my specimen is two feet one inch, over all (Bloch says the fish reaches a length of three or four feet). Its girth immediately before the pectorals, nine inches and four-eighths; girth behind the first dorsal, twelve inches. The head is depressed and broad. The eyes are large and long, with bright green round pupils and no nictitating membrane; over them the orbit is a strong bony ridge, and immediately behind them are blow-holes. Behind them and in front of the pectorals are five very small gill-apertures. The lips are very white and very fleshy and entirely cover the teeth. Bloch apparently described his fish from a specimen dead long enough for the fleshy lips to have dried back.

The mouth is very small. The teeth in the lower jaw are equilateral and in two rows, the outer one consisting of much smaller take than the inner one. The teeth in the upper jaw are numerous and in irregular rows and sharp-pointed, and I think all of them are serrated, but they are all so small that I am not certain about this. The first dorsal stands just over the pectorals, and the second just over the ventrals, and each dorsal has through it the spine I have described, and is free at the rear of the base for about half an inch. The belly is broad and flat; the pectorals

and ventrals lie flat out from it, and between them on each side there is a strong cartilaginous ridge, forming—with a similar one across between the pectorals—a flat space resembling the belly of the Monk (or Angel-fish), but harder.

The ventrals are distinct, and on the inner side of each is a rudimentary clasper. There are no anals, and the caudal is single-lobed, except that just where the fleshy part ends there is a slight indentation. The nostrils are large, underneath the snout, in advance of the mouth, and divided into two lobes each by two cutaneous flaps overlapping each other. Within is visible a very delicate membrane, something of the shape of a fern-leaf or the back-bone of a sole. The lateral line starts from the extremity of the nozzle, passes over the orbit of the eyes in a pale broad line down the side with a slight curve, and is entirely lost just behind the second dorsal.

The colour is dark cinereous in blotches over the back, and light cinereous on the belly, and the skin is the roughest I ever saw on any shark. The dorsals are very long and high. The first dorsal in my specimen is four inches and a half long at the base, three inches and four-eighths high at its extreme rear (where it is highest), and the spine is two inches and seven-eighths long; and the second dorsal, just five inches to the rear of the first, is nearly about the same size. As I have said, these large standing dorsals at once distinguish the fish, and if it ever gets common enough to require an English name it should be called the Spritsail Shark. Bloch mentions it as a Mediterranean species, and also as occurring in France, in the Northern Ocean, but I do not understand whether, by the Northern Ocean, he refers to the English Channel or the North Sea. My specimen is in the hands of Mr. Vingoe for preservation.

[The occurrence of *Squalis centrina* on the British coast is a new and highly interesting fact. This shark is an inhabitant of considerable depths, and is not uncommon in the Mediterranean, but we believe has not hitherto been found further north than the latitude of Lisbon. It is to be hoped that this important specimen will be well preserved and deposited in some public Museum.—ED.]

OCCASIONAL NOTES.

THE NATURAL HISTORY OF DONEGAL.—The paper on the Natural History of Donegal, by Mr. James A. Mahony, which you have introduced to the readers of ‘The Zoologist,’ has attracted my attention, as well by its style as by its statements; and taking as I do some little interest in Irish Natural History, it would, I believe, be prejudicial to the cause of truth were some of its passages allowed to go unnoticed. The descriptive paragraphs on the Physical Geography, Geology, and Botany of Donegal would be more appropriately criticised outside the pages of ‘The Zoologist;’ but coming to the list of Mammalia, and neglecting its omissions, we are informed that “The Squirrel, Ferret, Fox, Weasel, Bat and Hedgehog are often to be seen, and it seems to be quite true that there are no Toads, Moles or Snakes in Ireland.” If the Squirrel has reached Donegal, it is quite a new locality; and if particulars were given as to when, where, and by whom it was seen, the information would be more valuable. The Ferret is not wild in Ireland; and Thompson’s cautious statement as to the Weasel has rather been confirmed than controverted of late years. The Natterjack Toad is found near Dingle, County Kerry. As to birds, it may be said that the casual manner in which the Tawny Owl is alluded to shows rather Mr. Mahony’s ignorance as to its great rarity in Ireland than the accuracy of his observation. The Sedge Warbler is generally regarded as the “Irish Nightingale,” and not the Thrush; and the curious assertion about the “Common Crane” is no doubt correctly explained in the Editor’s note.—RICHARD M. BARRINGTON (Fassaroe, Bray, County Wicklow).

NATURAL HISTORY OF DONEGAL.—Allow me to offer a few remarks upon the notes on County Donegal, published in your last number (p. 149), as I think it very desirable to correct some errors in the zoological part. In the first place, I and other Irish naturalists would be much obliged to Mr. Mahony if he would inform us in what part of the county Squirrels are found in a wild state, and whether he himself saw them or took the statement on hearsay? So far as I know, the Squirrel is not found in any part of Donegal. The few Irish counties in which I have heard of its occurrence are Wicklow, Queen’s County (near Portarlington), and Kerry. By Ferret, I suppose your correspondent must mean the Marten (*Martes abietum*), which is still tolerably common in the wilder parts of Ireland; and of course the Stoat is intended when the Weasel is mentioned. Here I will take the opportunity of correcting a mistake which has somehow got about—that there is an Irish specimen of the Weasel in the Museum of Trinity College, Dublin. This specimen I myself sent up from Tyrone, and received in return an intimation that it was the true Weasel, and the first known Irish example: it is, however, but a small Stoat. I wish your

correspondent would tell us what species of Bats he has found in Donegal. The Hairy-armed Bat has been found in several widely-separated parts of Ireland, so that it may be discovered in other localities if naturalists would only take the trouble to look for it: at present it has been obtained only in the counties of Wicklow, Dublin, Armagh, and the town of Belfast. As for birds, the Tawny Owl is not proved yet to occur in Ireland, even as an accidental visitor, the only evidence on this subject which I have obtained being two eggs in the collection of Mr. Gage, of Rathlin, which that gentleman kindly entrusted to me to send to Prof. Newton, who considers that they probably belong to the Tawny Owl. These eggs are stated to have been found in a wood near Ballycastle, County Antrim. Perhaps, however, Mr. Mahouy means the Long-eared Owl, which is a very common Irish bird. I have never before heard the Song Thrush called the "Irish Nightingale," the bird which is generally called by that honourable title being the Sedge Warbler. Again, out of some hundreds of geese which I have seen from Loughs Swilly and Foyle, I never came across more than half-a-dozen Bernicles; and your correspondent probably means the Brent Goose, which is very common, and is called Bernicle by the peasantry. On p. 151, third line, *Chylodulia* should be *Chylocladia*: and lower down on the same page, *Eclimus sphaerae* is, I presume, a misprint for *Echinus sphaera*, though I have never found this Urchin anywhere except reposing on sand or rocks, and imagine that a large one would find some difficulty in "prowling over" the fronds of *Laminariae*.—J. DOUGLAS-OGILBY (Portrush).

[We have received a third letter to the same effect from an esteemed correspondent, who does not, however, desire its publication. By "Ferret" no doubt is intended the Polecat, an animal which, according to Thompson, is "not positively known as an Irish species," although said to inhabit the wild woods of Kerry, and to have been killed in at least one instance in the County Down. The Weasel is another animal whose existence in Ireland there is reason to doubt, although, as we have elsewhere pointed out, Mr. Bell, in his 'History of British Quadrupeds,' does not allude to it. Mr. Andrew Murray, in his 'Geographical Distribution of Mammals' (p. 114) says that the Weasel formerly inhabited Ireland, but is no longer found there. Macgillivray averred that the Weasel is generally distributed in Ireland, but Thompson, on the contrary, remarks that he never met with it there, nor does he consider that it has been proved to be a native, although it may be so. The Stoat, which is called Weasel in Ireland, is common there. It should be noted that the larger size, darker colour, and the black tuft at the end of the tail, will at all seasons distinguish the Stoat from its smaller relative. As regards the Squirrel, we have notes of its occurrence in the Counties of Dublin, Wicklow, Wexford, and Longford (where it was introduced in large numbers, at Castle Forbes, by either the father or grandfather of the present Earl Granard). It has been introduced

also at Carrickglass, County Longford, and Burton Hall Woods, County Carlow. As regards the County of Dublin, Squirrels are said to have crossed over from the County Wicklow some ten or fifteen years ago. Concerning all these animals, it would be very desirable to have further particulars, and we trust Mr. Mahony, at his leisure, will if possible supply them. So little comparatively has been published on the native mammals of Ireland, that any information respecting their existence, distribution, and scarcity, or otherwise, in the sister isle will be welcome.—ED.]

MAMMALIA SCOTICA.—At a meeting of the Glasgow Natural History Society, held on the 27th March last, Mr. James Lumsden, F.Z.S., read a paper “On the Mammals of the Neighbourhood of Lochlomond.” He said that in the country which borders on Lochlomond there has been found a large proportion of the land mammals of Britain, but as in other districts several species which were at one time common are now rarely if ever met with, the advance of agriculture and the greater attention paid to the preservation of game having been most destructive to many of our wild animals, as well as to our rapacious birds. Within late years a great change has taken place in the mammalian fauna of this district. At one time wild cats were well known, and martens, if not often seen, betrayed their presence by their thieving habits; polecats were not uncommon; rats (excepting a few of the harmless *Mus rattus*), rabbits, and squirrels were unknown; and mountain hares were seldom met with. How changed it is now! The wild cat, marten and polecat extinct, and the brown rat swarming in and around all farm-steadings, rabbits plentiful on hill and low country alike, and the mountain hare numerous on all the higher ranges. Squirrels are also common in all the plantations, and are extending their distribution. The nature of the ground around Lochlomond renders the district peculiarly suited for all kinds of mammals. In the agricultural land at the southern end of the Loch are found moles, shrews, mice and voles, while the more rugged ground at the northern end gives shelter to the wild animals and mountain hares. So far as is known no complete list of the mammals found throughout the Lochlomond district has ever been drawn up, although the subject has not been neglected by naturalists and others. Mr. Lumsden then submitted a list of twenty-six species found in the district, and stated that in the notes accompanying it he had not attempted to describe the habits of any of these, as this had already been ably done by others, but had only endeavoured to record the present as compared with the past state of the mammalian fauna in the particular neighbourhood which he had explored.

CURIOUSLY COLOURED MOLE.—A very pretty variety of the mole was brought in to be stuffed on the 17th February. Its fur was exactly the colour of orange-peel; it had a reddish stripe down the belly and a few black stripes across the back. Unfortunately it was not sent till too far gone to

be preserved. The birdstuffer informs me that he has had many curious varieties of the mole sent to him, but that this is by far the handsomest he has seen.—C. MATTHEW PRIOR (Bedford).

[Mr. Bell, in the second edition of his 'British Quadrupeds' (p. 139), notices several remarkable varieties of the mole, and amongst others the variety here described. He says, "It is found of a deep black colour, of a mouse-colour, dark olive-brown, pied, yellowish white, and wholly or partially orange."—ED.]

THE MERLIN IN SOUTH WILTS.—During the past winter I have had four notices of the occurrence of the Merlin in the immediate neighbourhood of Salisbury, which either proves that this bird is commoner in the district during the winter months than I at all realized, or else that there has been an unusual immigration of the species during this particular season. In November a fine male bird was shot by Mr. Powell, of Hurdcott House, some six miles from Salisbury; and in the same month another specimen was brought to the stuffer at Warminster, also a male bird. On the 2nd of January, 1877, I had a nice hen bird sent to me, also from Hurdcott, which had been shot by Mr. J. A. Tyndale Powell, and is now in the hands of Hart for preservation. The same gentleman, while shooting with a friend on January 13th, discovered a fourth specimen, a hen, much brighter in colour than the one he had previously sent me. It had been shot by the keeper about a fortnight previously, in the adjoining wood, and was hung up by the head on the keeper's gallows. I am glad to find from this that the Merlin is not so uncommon in the South as I at first thought. I have only noticed it myself once since I have been living in these parts, now some sixteen years, when I saw a hen bird chasing a Sky Lark, in pursuit of which it made fourteen distinct stoops, the end of the chase being hidden from me by the trees. Some little time back I wrote to Hart, of Christchurch, to enquire about the prevalence of the Merlin in the Christchurch neighbourhood, and he wrote me back word "Merlin and Hobby killed frequently," and on making a second enquiry of him he wrote "I find the Merlin is nearly as often killed as the Hobby; possibly the Hobby is killed oftener, but does not find its way to me," and during October, when at Christchurch myself, he showed me several specimens, one, a beautiful male bird, which he had himself shot while attacking his poultry, and which had not a single intermediate bar on its tail, thus resembling that of an adult male Kestrel, only blue in shade. No doubt it occasionally breeds in the New Forest.—ARTHUR P. MORRES (Britford Vicarage, Salisbury).

[Mr. Wise, in his 'History of the New Forest' (p. 267), notices the fact of the Merlin occasionally breeding in the New Forest. He says in 1859 and 1861 Mr. Farren received two nests with three eggs, taken in old pollard hollies growing in the open heath, which in every way corresponded

with those of the Merlin, being considerably smaller than those of Kestrels. Unfortunately, however, he could not procure the parent birds, and the fact of the Merlin's nesting remained doubtful. In 1862 he was at last successful, and on May 22nd discovered a nest placed in the hole of a yew, also containing, like the others, three eggs, from which the male was shot. The important fact, however, to be noticed is that, as Temminck remarks, the Merlin in a woody country builds in trees, whilst in the north of Britain, where there is no timber, it adapts itself to the country and lays on the ground.—ED.]

PURPLE GALLINULE IN SOMERSET.—Under this heading, at p. 178, I see the Rev. M. A. Mathew records the occurrence of this bird at Badgworth, in this county, in August, 1875. Lest Somerset should be credited with two Purple Gallinules,—possibly with three, for Mr. Mathew says something about another having been seen when this one was taken,—I think it worth while to mention that this bird was recorded in the February number of 'Science Gossip' for 1876, and in the following number I made some remarks on the occurrence, and suggested the extreme probability of this bird being an escape, and from enquiries I have since made I see no reason to alter this opinion. I may add that there is no mention in the original notice in 'Science Gossip,' which gives a rather circumstantial account of the capture, of a second bird having been seen at the same time. This, therefore, as a story seldom loses by repetition, may be only one of those little additions which often creep into records made so long after the event. It strikes me as just possible that this bird may have escaped from the same place as the South American Rail (*Aramides cayennensis*), mentioned in the January number of 'The Zoologist' for this year by the Rev. A. C. Smith; the distance is not at all too great, and the birds may have escaped from some intermediate place. In his notice immediately preceding the one above quoted, Mr. Mathew laments the slaughter of Owls in the neighbourhood of Taunton. In this lamentation I quite agree; but Mr. Mathew is wrong in stating that his friends the Owls are without protection. If he will look at the Wild Birds Protection Act of 1872 he will see that the word "Owl" does occur in the Schedule, and as there is no specific limitation, both the Barn Owl and the Brown Owl—indeed all the British Owls—enjoy the protection of the Act. The two Bird Acts are very little known, and I am glad to see that you have reprinted the Act of 1872 with that of 1876.—CECIL SMITH (Bishop's Lydeard).

[Specimens of the Purple Gallinule have on several occasions been found at large in this country, but have generally been regarded as escaped birds. One, shot near Campbeltown, in Argyllshire, in December. 1863, is mentioned in Mr. Gray's 'Birds of the West of Scotland,' p. 337. In August of the same year one was killed at Rowner, in Hampshire

(‘Zoologist,’ 1865, p. 9418, and 1867, p. 829). On the 25th September, 1876, a Purple Gallinule was shot near Grange in Furness, Lancashire, by Robert Allan, gamekeeper to Mr. E. Mucklow, of Castle Head, Grange, and was preserved by Kirkby, the taxidermist, of Ulverston. We are further informed by the Rev. E. W. Dowell, of Dunton Vicarage, Fakenham, Norfolk, that an adult bird of this species was killed in one of the head streams of the Wensum River, at Tatterford, early in October, 1876. Mr. John Marshall, of Belmont, Taunton, has a bird of this species in his collection, which he purchased some years ago at Mr. Troughton’s sale, and which was labelled as killed in Ireland. Thompson, in his ‘Natural History of Ireland’ (Birds, vol. ii. p. 331, note), refers to a specimen of this bird which was found about the first week of November, 1845, lying dead in a ditch near the village of Brandon, on the coast of Kerry.—ED.]

OCCURRENCE OF THE LITTLE OWL IN SUSSEX.—On the 16th March last I saw in the shop of Mr. Pratt, naturalist, Brighton, a specimen of the Little Owl (*Noctua passerina*), which had been shot the previous evening in an orchard close to the town of New Shoreham. It was in most perfect plumage, not showing the slightest sign of having been in confinement. On dissection it proved to be a female, and the ovary contained about thirty eggs, of which four were considerably advanced. The stomach contained nothing but a few grains of gravelly detritus. This is only the second specimen I have met with, or heard of as having been killed in this county. The first, a male in my collection, was obtained, also in an orchard, near Fletching Park, in May, 1843. The female bird, which I have now secured, is rather the larger bird of the two.—WILLIAM BORRER (Cowfold, Horsham).

[The synonymy of this species, is extremely confused, scarcely two writers being agreed as to the name it should bear. It is clear, however, that it is not the *Strix passerina* of Linnaeus, which is a perfectly distinct and much smaller European species, and has not been met with in this country. In his new edition of Yarrell’s ‘British Birds,’ Prof. Newton, following Prof. Sundevall, identifies it with the *Strix noctua* of Scopoli, and points out (vol. i. p. 118) that as the generic names *Athene* and *Noctua* are preoccupied in Entomology, its proper designation, according to the Rules of Zoological Nomenclature, is *Carine noctua* (Scopoli).—ED.]

NOTE ON THE SHORT-EARED OWL.—On the 3rd April a Short-eared Owl was sent to me by an experienced and intelligent gamekeeper in the parish of Northrepps, Norfolk, with a note, from which the following is extracted:—“Lately we have seen where three Partridges have been killed, and yesterday morning the remains of a fourth were brought to me, which, after carefully examining, I considered to be the work of an Owl, so a trap was set in the evening, baited with the remains of the Partridge. The trap was watched, and just after dusk an Owl was seen working the

field over: it then alighted on the ground, when a pair of Partridges were seen running away from the Owl, when the Owl flew and attacked one of them, but after a few seconds the Partridge got away, the Owl pursuing it on the wing for a short distance. After this the Owl came and hovered over the baited trap, and whilst doing so was shot. I always thought that these Owls only preyed on rats, mice, larks, &c., but I now believe they destroy game." On dissection the Owl proved to be a male, and the stomach was empty.—J. H. GURNEY (Northrepps Hall, Norwich).

PARTRIDGES COLOURED LIKE RED GROUSE.—At a recent meeting of the Natural History Society of Glasgow Mr. Harvie Brown exhibited two extremely handsome varieties of the Common Partridge (*Perdix cinerea*), forwarded to him by Mr. George Sim, naturalist, Aberdeen. These birds, along with four others, were shot by General Shaw, on the estate at Glasshaugh, near Portsoy, in the beginning of October last. They had been seen in different covers for some weeks before being killed, and since then the people in the neighbourhood reported to General Shaw that similar birds had been seen in previous years about the same neighbourhood. Mr. Sim says that the females, of which there were four, were all alike in plumage, being brown on the breast, while the upper parts are beautifully marked with transverse bars of light brown over a ground colour of drab—the brown being of greater density in some individuals than in others. The male differs markedly from the female, having a preponderance of the rich grouse-like chestnut-brown on the back, as well as on the breast. Mr. Sim had compared these birds with the description and plate of *Perdix cinerea*, var. *montana*, in the 'Naturalist's Library' (vol. iv. pl. 2), and found them to agree with that variety, which Sir William Jardine states is common on the plains of the Zuyder Zee in Holland. Mr. Harvie Brown observed that examples of the same variety had been found on the higher grounds of Forfarshire bordering the moors, and often among the heather, where they are known as "Hill Partridges" (see Gray's 'Birds of the West of Scotland,' p. 242). He suggested that the variation had been induced by food, looking at the almost perfect grouse-like colour, especially of the male; but added that if these birds are identical with Sir W. Jardine's var. *montana*, it would be difficult to account for the variety arising from food supply when it is found upon the low-lying flats of Holland, and he was at a loss to know why it was named *montana*, unless it was discovered in a more mountainous country than Holland, where the summit of the highest hills are only some thirty feet above the level of the sea. These two birds weighed $13\frac{1}{2}$ and 15 ounces respectively. Extent of wings, in both, $19\frac{1}{2}$ inches; bill to the point of tail, $12\frac{1}{2}$ inches.

[Mr. Harvie Brown seems to have misunderstood his author. Sir William Jardine in the work quoted does not say that this variety is "common on the plains of the Zuyder Zee," but speaking of the variation

of plumage to which the Common Partridge is liable, he says (p. 80), "those birds which frequent and are bred on the marshy grounds of the Zuyder Zee and mouth of the Meuse are less in size and of a duller tint than those found in the drier lands of Belgium." He observes correctly enough in his very first sentence that "this variety has been said to be more frequently found in alpine districts than in lowlands, but they are known to mingle occasionally with those of the common plumage." Some years ago we received a Partridge of this colour, which with others like it had been shot in Northumberland : it is preserved in the collection of Mr. Bond.—ED.]

CUCKOO IN REDDISH BROWN PLUMAGE IN SPRING.—In every point of its economy the Cuckoo seems destined to perplex naturalists. The occasional occurrence of brown Cuckoos in the spring must be known to everyone who has made a study of British birds. I say "brown" as contrasted with the adult gray plumage. They generally are more rufous than the young of the year, these brown birds differing from them about as much as the young in September often differ from one another. I have seen several of these curiously-coloured Cuckoos, and I have two in my possession, one a male shot at or near Cambridge in 1868, and another, the sex of which was not ascertained, shot at Bridlington, in Yorkshire. The latter measures :—Wing, $7\frac{1}{2}$ inches ; tarsus, $\frac{1}{2}$ inch ; culmen, $\frac{3}{8}$ inch. Both are small, under-sized birds, and I may add that both have the occiput blotched with white, but I do not know that this is curious, as I have often noticed it in young Cuckoos in September.—J. H. GURNEY, JUN. (Northrepps Hall, Norwich).

DARTFORD WARBLER IN SUFFOLK.—On the 6th April I came upon a pair of these little birds among some furze-bushes on the heath near Blaxhall, Suffolk. One of them (probably the male) was flying restlessly from bush to bush, something in the manner of a Stonechat or Whinchat, uttering all the while a sort of scolding note, similar to that of many of the warblers when nesting : the other was shyer, and kept diving into the bushes, not allowing me to have a good view of her. This is the second time I have met with this bird near here. (See 'Zoologist,' 1874, p. 3865). Mr. Stevenson, in the same volume (p. 3914), mentions a specimen shot on Naeton Heath as being the only other Suffolk example he was aware of ; so that the above-mentioned pair make the third occurrence, so far as I know, of this species in this county.—G. T. ROPE (Blaxhall, Wickham Market).!

REDNECKED GREBE IN ESSEX.—On February 3rd I observed a Red-necked Grebe on the large sheet of water in Wanstead Park. My companion and myself, both provided with telescopes, were able to approach within easy range by taking advantage of its diving. The bird was unmistakably a Grebe, and in order to verify the species with certainty I made a rough sketch on the spot, noting the following characters :—The white on the throat and cheeks clearly defined and running back under the black

crown of the head, nearly to its termination in a slight crest, the latter made more apparent when curled up by puffs of wind. The dull red of the neck merging into the dark colour of the back and wings, and blending below with mottled markings into the pure white of the breast. Under parts pure white, joining the conspicuous white patch on the wing (the secondaries). On examining the specimens in the British Museum, this bird appeared to correspond most closely in size and colour with that recently added to the collection by Mr. Sharpe, and obtained from the North of Europe, but the under parts were more purely white than in that example. The Grebe was on the same piece of water the following day, but too distant for satisfactory observation; on being disturbed it flew with considerable power, alighting again in the middle of the pond; by the next day it had left. I may mention that on January 30th about thirty Herons returned to the heronry in the woods of the Wanstead Estate.—ARTHUR LISTER (Leytonstone).

[So far as our experience goes, the Rednecked Grebe is the rarest of all the Grebes that reside in or visit the British Islands, and is only found here in winter. We have occasionally met with it in the tidal harbours and creeks of the Sussex coast when out after wild-fowl in January and February, but have never seen more than one or two together at a time. It rarely remains here late enough in spring to display the complete breeding plumage.—ED.]

VARIETY OF THE SAND MARTIN.—At p. 106 Mr. Corbin mentions the occurrence of a variety of the Sand Martin. My father has in his possession a peculiar variety of this bird, which I caught a few years ago. I first saw it hawking for flies in the vicinity of a water-worn bank, in which a somewhat numerous colony breed annually, and after watching its untiring—though in my judgment not very happy—motions for some time, I at last succeeded in capturing it in one of the nests. Its darker relations seemed to regard it with intense dislike, chasing it with more or less anger whenever it came near them. In this bird the upper plumage is of an uniform bluish white, the lower parts from the beak to the vent of a pure glossy white.—E. P. BUTTERFIELD (Wilsden).

WHITE SKY LARK AND OTHER BIRDS NEAR YORK.—Mr. Ripley, the birdstuffer here, has lately received for preservation a Hawfinch, a pure white Sky Lark, and a pied Blackbird. The Hawfinch, a female, was shot during the early part of February, within four or five miles of York: it is rather a rare bird here. The Sky Lark, which I found to be a female, was shot on Askham Bog near here, about the 15th of the same month. The whole of its plumage was pure white: the bill, legs, and claws were extremely light-coloured, but the iris was rather dark. The Blackbird, a male, was shot about the same time, not far from here, and it was rather curiously pied. The neck and head were pure white, with the exception of

a few light brown feathers on the front of the former. By far the larger number of the feathers on the breast, back, and wings were white, but the tail was of the usual colour.—ROBERT M. CHRISTY (20, Bootham, York).

MERGANSERS AND DIVERS INLAND.—A Red-breasted Merganser and a Black-throated Diver were shot near Banbury in January this year. The former at Edgecote, by one Harrod, a gamekeeper, the latter on the Cherwell, by a boatman named Hunt.—C. MATTHEW PRIOR (Bedford).

LITTLE BITTERN AND SPOTTED CRAKE IN OXFORDSHIRE.—When in Banbury one day in December, I was asked to go and see a specimen of the Little Bittern which had been shot near that town, on the Cherwell, by one Frederick Murray, a boatman, on the 27th October, 1867. It was much knocked about, having been shot the moment it rose, but the shattered bits were collected together and stuffed by W. Wyatt for its captor. I was also shown three specimens of the Spotted Crake, which I am informed is not unfrequently obtained in the vicinity, and one of which I purchased.—ID.

LAND AND FRESHWATER SHELLS OF SCOTLAND.—At a meeting of the Natural History Society of Glasgow, held on March 6th, Mr. David Robertson exhibited specimens of fresh-water shells, the first of which, the little bivalve *Pisidium fontinale*, var. *Henslowana*, was taken in the Glasgow and Paisley Canal. It is the *Pisidium Henslowana* of Shephard, and was first discovered by Professor Henslow in the River Cam, near Cambridge. It occurs in many of the northern, eastern, and south-western counties of England, as well as in South Wales and Cork, but hitherto it has not been discovered in Scotland. Such small shells are apt to be mistaken for closely allied species, but in this case the most cursory inspection would discover the remarkable little elevated plate on each valve near the umbos, which at once distinguishes it from all its congeners. The other shell is *Planorbis complanatus*, and is found moderately common in Lochend Loch, Edinburgh. Mr. Robertson also showed *Helix villosa*, a land shell, four living specimens of which were taken on the flat ground or moors near Cardiff, by Mrs. Robertson, and not being able to refer them to any British species they were submitted to Mr. Jeffreys, who pronounced them to be *Helix villosa* (Drap.), and has recorded the species in the 'Annals and Magazine of Natural History' for February as an addition to our British Mollusca. *H. villosa* inhabits Germany, France, and Switzerland, and it often occurs at a considerable height above the sea. Mr. Jeffreys refers to *H. alpestris*, a British variety of *H. arbustorum*, as having similar habits. It is met with on the Swiss Alps, in the region of perpetual snow, as well as on the marshes and banks of English rivers, an example of the great elasticity of such animals in accommodating themselves to different conditions of habitat and temperature.

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THE BIRDS OF THE MOY ESTUARY AND THE SURROUNDING DISTRICT.

BY ROBERT WARREN.

THE district to which the following notes relate comprises those parts of the Counties of Mayo and Sligo which are situated within a ten mile radius of Moyne Abbey, which is taken as the centre of the district. The list unfortunately is somewhat imperfect, as, from the difficulty of obtaining authentic and reliable information, I have been obliged to depend almost entirely upon my own observations; and in order to have the list correct, if not long, I have hesitated to insert the name of any bird that I have not identified myself, unless confident of the correctness of the information supplied to me concerning it.

Order RAPTORES.

Sea Eagle, *Haliaëtus albicilla*.—This fine bird, some few years ago, was to be seen nearly every winter frequenting the sand-hills of Bartragh and Enniscrone, feeding on rabbits and on dead fish cast ashore by the surf. In December, 1851, a pair of Sea Eagles haunted the sand-hills of Bartragh for several days, one of which I shot as it was resting after a heavy meal of rabbit and hake: it was a fine bird in the second year's plumage. The second bird remained about the sand-hills for some time after, but I think got off unharmed; nor would I have shot the bird mentioned but that I wanted to set it up as a specimen. I used frequently to see or hear of Eagles being about Bartragh up to 1856; but since then I have neither seen nor heard of a bird visiting this locality, and

their continued absence I attribute to traps and poison, for of late years it has become the custom to poison the mountain shootings as soon as the season is over, and as the Sea Eagle will eat any kind of carrion it readily falls a victim to the poisoned meat and traps of the keeper.

Greenland Falcon, *Falco candicans*.—Very rare, and has only once been obtained in the district. A fine adult female was shot by a country boy near Killala, on the 3rd April, 1875, and very fortunately came into the hands of Lieut.-Col. Knox, of Castlerea, who presented it to his brother, Mr. A. E. Knox, of Sussex, the well-known author of that delightful work, ‘Ornithological Rambles in Sussex.’ In the winter of 1868, a fine adult male of this species was shot near Belmullet, about forty miles from here, and is now in the collection of the Dublin Natural History Society.

Peregrine Falcon, *Falco peregrinus*.—Resident, and breeds on the high cliffs on certain parts of the coast. It appears to be more numerous in winter; perhaps some addition to its numbers by migratory birds may take place at that season. Lapwings in this locality appear to form a favourite part of its food, and afford some most exciting flights, far finer than any to be witnessed with trained falcons. A short time back I saw the finish of a splendid flight: the poor Lapwing was quite worn out, and in order to avoid the last stoop of the Falcon dropped into the water, but the Falcon was not to be beaten, and, poising herself for a moment, gently lowered her feet and, lifting the Lapwing from the water, bore it away.

Merlin, *Falco æsalon*.—Resident, but oftenest seen during winter. It nests annually amongst the heather in the neighbourhood of Lough Eask, in the Ox Mountains, Co. Sligo.

Kestrel, *Falco tinnunculus*.—Very common and resident, breeding in the old ruins throughout the country and in suitable rocky cliffs around the coast.

Sparrowhawk, *Accipiter nisus*.—Very common throughout the wooded districts. The young are exceedingly ravenous. In the summer of 1857 a pair built a nest and hatched four young in a larch tree close to the dwelling-house here, and being so near I used to visit the nest almost daily, but on one occasion when looking into it, a short time before the young were fledged, I saw only three birds. On making a closer search, however, I saw a clean-picked leg of the missing one at the bottom of the nest, and the other leg, in a similar condition, lying at the foot of the tree, plainly showing that it had

been devoured by its fellows. A pair of Sparrowhawks build every year in the plantations about Moyview, and invariably construct a fresh nest each season, neither repairing their old nests nor those of Magpies or other birds, and I remarked the same habit with the Sparrowhawks building in the finely timbered demesnes of Coolmore and Ballybricken, in the County Cork. Those nests that I discovered before the females began to sit had a well-formed cup-shaped cavity in the centre, with nicely rounded edges; but after the young were hatched the edges got flattened out, and by the time they were fledged the nest had become a loose, slovenly-looking platform, exactly like the ruins of an old deserted nest of Crow or Magpie.

Buzzard, *Buteo vulgaris*.—Rare in this district, and has only twice come under my notice, at Moyview, flying about the plantations. During the past winter, however, I saw a fine bird of this species on the sands near Bartragh, and again on the Enniscrone sand-hills, beating about over the rabbit-burrows. This bird I have every reason to think must have been the one that was afterwards killed by some boys at night in a plantation at Scurmore; as they were bird-catching with a light they met the bird roosting on a low tree, and fancied it was a young Eagle.

Marsh Harrier, *Circus aeruginosus*.—I cannot with certainty say I have met with this bird, but when snipe-shooting I have occasionally seen birds which may have been of this species.

Hen Harrier, *Circus cyaneus*.—Rare in this part of the country. I have only seen one old male. It is known to sportsmen about here as the “Sea-gull Hawk,” from its colour.

Long-eared Owl, *Strix otus*.—Common and resident in the wooded districts. A pair rear their young in some old deserted nest (generally a Magpie's) in the plantations here every season, and I have on several occasions sent young birds to the Dublin Zoological Gardens. During the breeding season the males may be heard nearly every evening amongst the trees uttering their very peculiar call-notes, which, when heard at night proceeding from gloomy woods, gives one the idea of some unfortunate person moaning in the extremity of distress. It may be imitated by the words “hoo—hoo—hoo” repeated very slowly; the *h* quite soft—almost a silent one. My attention was first directed to this moaning call of the owls in January, 1864, by some of the servants rushing into the sitting-room one evening, about eight o'clock, to say that some one was dying in the wood near the cattle-house,

for they heard the dying moans. I went out to listen, and I certainly felt puzzled as to what animal produced the sound. At first I thought that some of the cattle might be choking from becoming entangled in the neck-chains, but on going to the cattle-house I found everything quite still and quiet, and the moans coming from the trees, showed that it was some bird; but as I had never read any description of the cry of the male Long-eared Owl in the breeding season, I could not imagine what bird it was. However, the night being moonlight I followed the sound, and when I got near the tree I saw a dark bird glide silently away, giving a slight flap of its wings when just leaving its perch, the noise made by the flap being scarcely audible. I thus followed the bird about the place for over an hour, but could never see it in the act of calling, as the only sight I could get of it was on its leaving one tree for another when disturbed; so I had to return without being satisfied as to its identity, though at the same time I was quite confident it was some kind of owl. For several nights I followed the bird with my gun, but was unsuccessful in obtaining a shot at it, though after a time I began to be almost certain that it was the Long-eared Owl; but, of course, unless I shot the bird or distinctly saw it in the act of calling, I could not be certain of its identity. This tantalizing state of things continued until the succeeding month of March, when one evening I was riding home from Ballina, and just before dark, as I was passing a grove, I heard the call from some trees close to the road. I immediately stopped, and closely watching the trees in a few moments had the satisfaction of seeing a fine Long-eared Owl sitting on the branch of a larch tree in the very act of "moaning"; and about a month later I had a good view of another, close to the house here, also calling. The young when half fledged, before they leave the nest, and for several weeks after they leave it, may be heard calling incessantly for food, and their loud plaintive cries readily attract attention to their retreat. The female has a very queer yelping kind of alarm-note when the young are approached, quite different from the moaning of the male bird or the cry of the young.

Short-eared Owl, *Strix brachyotus*.—A regular winter visitor to the heaths and low grounds, and is sometimes found in small flocks by snipe-shooters.

White Owl, *Strix flammea*.—Resident and common in the numerous old ruins throughout the country.

Snowy Owl, *Strix nyctea*.—A rare winter visitor, or perhaps should rather be classed as a straggler, having occurred only twice in this district. The first that appeared was shot by the late Mr. T. Palmer, in his demesne, Summer Hill, near Killala, on the 26th January, 1856; and the second was seen in November, 1860, by Mr. Palmer's son, at the same place, but he was unable to secure it. The specimen obtained by Mr. Palmer is now in the possession of Colonel E. Knox, of Castlerea, near Killala.

Order INSESSORES.

Spotted Flycatcher, *Muscicapa grisola*.—A regular summer visitant to this district, but late in making its appearance. Two pairs build in the garden and trees near the house here every season. In 1872 it was first seen on the 31st May, and observed building on the 11th June. In 1873, first seen on the 15th May, and hatching on the 1st June. In 1875, first seen 17th May. In 1876, 14th May.

Pied Flycatcher, *Muscicapa atricapilla*.—The first recorded visit of this bird to Ireland was noticed by me in 'The Zoologist' for June, 1875 (p. 4498). It was an adult female bird and appeared here on the 18th April of that year. My attention was attracted by seeing it catching insects, and it appeared to me so strange that a Flycatcher should be seen so early in the season that I watched it attentively for some time. Observing that it had a smaller head and closer-looking plumage than the Spotted Flycatcher, as well as a faint appearance of white on the wing, I began to doubt its being of that species; so the following day, to make certain, I shot it, and then found it to be a female Pied Flycatcher. It is preserved in the Museum of the Royal Dublin Society, Kildare Street, Dublin.

Dipper, *Cinclus aquaticus*.—Resident wherever there are suitable rocky streams.

Missel Thrush, *Turdus viscivorus*.—Resident and common, and has become more numerous here of late years. When seen in parks in September these birds are often mistaken for Fieldfares.

Fieldfare, *Turdus pilaris*.—A regular winter visitant.

Song Thrush, *Turdus musicus*.—Common, but not so numerous as in the County Cork, nor do I see much addition to their numbers at the time of the autumnal migration, probably because the line of migration is more to the eastward.

Blackbird, *Turdus merula*.—Very common, and more numerous than the Thrush, which it outnumbers in about the same proportions as the Thrush did the Blackbird in that part of the South of Ireland where I formerly resided—*i.e.* at Castle Warren, Co. Cork.

Ring Ouzel, *Turdus torquatus*.—A summer visitor to suitable localities in the mountain district. I have seen it near Lough Talt, in the Ox Mountains, County Sligo.

Redwing, *Turdus iliacus*.—A regular winter visitant.

Hedgesparrow, *Accentor modularis*.—Common.

Redbreast, *Erythaca rubecula*.—Common.

Stonechat, *Saxicola rubicola*.—Common and resident.

Whinchat, *Saxicola rubetra*.—A summer visitor in very limited numbers to particular localities, and as it seldom leaves its favourite feeding-grounds, is but seldom noticed by the casual observer. I never met with it on the Sligo side of the Moy, but on the Mayo side it is to be found every summer haunting some waste fields near a scrubby hazel covert about a mile from the town of Killala.

Wheatear, *Saxicola œnanthe*.—A regular summer visitant, very commonly distributed throughout the district.

Sedge Warbler, *Salicaria phragmitis*.—A regular summer visitant.

Whitethroat, *Sylvia cinerea*.—A regular summer visitant, generally appearing in this neighbourhood some time in May, from three weeks to a month later than the Willow Wren.

Willow Wren, *Phylloscopus trochilus*.—A regular summer visitant arriving in April, and, except the Wheatear, the most numerous of all our summer birds.

Chiffchaff, *Phylloscopus rufa*.—Rare in this district, its haunts being restricted to a few old timbered demesnes. A straggler occasionally remains here in the Moyview trees for a day or two, but then passes on to the finely-wooded demesne of Belleek Manor, the seat of Sir Charles Knox Gore, situated three miles further up the river. It appears strange that none of these little birds remain here during the summer, for the timber is at least sixty years old, and covers about forty acres. In the South of Ireland I have known this bird to frequent much smaller patches of wood, and of younger growth, but in the neighbourhood of very old elms; so that probably aged trees are their favourite feeding-grounds, which they like to return to after an occasional forage amongst younger trees.

Golden-crested Wren, *Regulus cristatus*.—Resident and very common throughout the district, where there are suitable plantations.

Great Tit, *Parus major*.—Resident and common.

Blue Tit, *Parus cæruleus*.—Also common.

Cole Tit, *Parus ater*.—Common throughout the district. All three species build and rear their young in holes of walls about this place; indeed I have seen nests of the three species in the same wall of the farm-yard, with not many yards between the nests. They are very fond of feeding on oats, and it is most amusing to see the quickness with which such a feeble little bird extracts the grain from the husk, by placing it under its foot and, holding it firmly, twisting off the husk with its bill. Both the Blue and Cole Tits are very expert at this mode of shelling.

Long-tailed Tit, *Parus caudatus*.—Not common in the district, although Sir Charles K. Gore informed me that it is resident in the Belleek Woods. I have only observed it here at Moyview in the winters of 1857-58 and 1858-59, when it was very common in the plantations.

Pied Wagtail, *Motacilla Yarrellii*.—Resident and very common throughout the district, even in winter.

White Wagtail, *Motacilla alba*.—Has once occurred here. I shot one in a ploughed field on the island of Bartragh, April 25th, 1851: it appeared to move about more quietly than the Common Wagtail, and looking so much lighter in colour than that bird, I was induced to shoot it, and sent it to Dr. Harvey, of Cork, who confirmed my opinion by pronouncing it to be *Motacilla alba*.

Gray Wagtail, *Motacilla boarula*.—Although a resident, is not commonly distributed through this district. I have met with young birds on the banks of the Moy close to Ballina.

Yellow Wagtail, *Motacilla Rayi*.—A beautiful adult male visited this place on the 15th April, 1875. I saw it following a plough and picking up grubs and insects as they were turned up. It remained for only one day, and then disappeared.

Meadow Pipit, *Anthus pratensis*.—Resident and very common. Some years ago, in the month of September, while rabbit shooting early one morning, on the island of Bartragh, I witnessed a most extraordinary gathering of Titlarks. They appeared to have been resting after a long flight, and when I disturbed them in passing, the entire flock of about two hundred birds all took flight directly

towards the mainland in a south-westerly direction. I was at first at a loss to account for such a gathering, as the number of resident Titlarks on the island could scarcely amount to a score, but the fact of such a number being collected together, and all taking flight in the same direction from the island, lead me to conclude that this was a migratory flock which had been driven out of its course by winds or fogs, and had rested on the island as the first land made on coming from the open sea up the bay.

Rock Pipit, *Anthus petrosus*.—Frequents the coast throughout the year.

Sky Lark, *Alauda arvensis*.—Very common throughout the year, but appears to me to be more numerous in the south during winter.

Snow Bunting, *Emberiza nivalis*.—A winter visitant, some years appearing in very large flocks on the island of Bartragh in March, probably collecting together before leaving for their northern summer quarters.

Common Bunting, *Emberiza miliaria*.—Resident in very limited numbers throughout the district.

Yellow Bunting, *Emberiza citrinella*.—Very common, and the most numerous of the resident species.

Reed Bunting, *Emberiza schoeniclus*.—Very common in the district, owing to the extent of wet land, so suitable to its habits.

Chaffinch, *Fringilla cœlebs*.—Very common.

House Sparrow, *Passer domesticus*.—Scattered throughout the district in little communities, although it cannot be called numerous anywhere.

Green Linnet, *Coccothraustes chloris*.—Resident and common in suitable localities, though not seen here in such numbers as in the South of Ireland.

Hawfinch, *Coccothraustes vulgaris*.—I have only once met with this bird here. In November, 1857, I saw a very fine one feeding on the red berries of a creeping shrub close to the sitting-room window at Moyview. It came close enough to the window to afford us a good view of it.

Goldfinch, *Carduelis elegans*.—Resident, breeding in the gardens and trees near the house. A few summers ago a pair had a nest in an elder tree in the garden and reared their young, but for several days after I saw some of the young had left the nest I heard the plaintive call of a young one within it. I did not mind it at first,

but hearing the cry day after day without ceasing, I climbed up and found a fully fledged young bird fastened by the leg to the bottom of the nest, its little claws having become entangled in the wool used in its construction. This was so finely twisted round the foot that before I could disentangle it I was obliged to bring it down from the tree. Last summer I found a young Spotted Flycatcher fastened to its nest in a similar way, but although quite fledged its wing-feathers had been so worn away by rubbing against the nest in its struggles to escape that it was quite unable to fly when set free.

Siskin, *Carduelis spinus*.—Rare: I have only once met with it here, when I observed three birds (two females and a male) feeding on a ditch bank, along with some Goldfinches, in December, 1872.

Lesser Redpoll, *Linaria minor*.—Rare, though resident in very limited numbers. One or two pairs have nests every season about the garden and plantations. I found a nest built in a larch tree about twelve feet from the ground, and also found young birds in the plantations when scarcely able to fly.

Mountain Linnet, *Linaria flavirostris*).—The commonest of all the Linnets that frequent the district, and hundreds may be seen in winter feeding amongst the bent grass on the island of Bartragh, where numbers also breed and rear their young in summer.

Common Linnet, *Linaria cannabina*.—Common, but not to be seen in such numbers here as in the South of Ireland.

Bulfinch, *Pyrrhula vulgaris*.—Rare: I have only occasionally observed it during winter, and I do not remember ever seeing it in this district in the breeding season, although it may take up its abode wherever there are brakes of its favourite sloe or blackthorn.

Starling, *Sturnus vulgaris*.—Exceedingly numerous during winter, and a few pairs breed in the cliffs of Killcummin Head, Killala Bay.

Chough, *Pyrrhocorax graculus*.—Scarce: a few pairs breed in the sea cliffs of Killcummin Head.

Raven, *Corvus corax*.—Has become very scarce of late years, owing to the constant trapping and poisoning which is carried on. During the past five or six years I have only seen one solitary bird in the district.

Gray Crow, *Corvus cornix*.—Rather common, but not so numerous as in the South of Ireland. A pair builds every season here in a grove near the shore.

Rook, *Corvus frugilegus*.—Resident and numerous.

Jackdaw, *Corvus monedula*.—Very numerous in this district on account of the great facilities afforded for building in the ruined abbeys and castles.

Magpie, *Pica caudata*.—Very common.

Tree Creeper, *Certhia familiaris*.—Occasionally seen here. In the fine old timber of the demesne of Belleek Manor, near Ballina, it is resident and common.

Wren, *Troglodytes vulgaris*.—Common.

Cuckoo, *Cuculus canorus*.—A regular summer visitant.

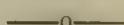
Kingfisher, *Alcedo isspida*.—Occasionally seen in winter, when a solitary bird sometimes visits the shores of the Estuary.

Common Swallow, *Hirundo rustica*.—Regularly visits this district about the middle of April. The dates of its appearance for the last few years are as follows:—1872, 13th; 1873, 16th; 1874, 8th; 1875, 16th; 1876, 18th; and 1877, 12th of April.

House Martin, *Hirundo urbica*, Sand Martin, *Hirundo riparia*, and Swift, *Cypselus apus*.—Regular summer visitants, the Swift making its appearance later than either Swallows or Martins.

Nightjar, *Caprimulgus europaeus*.—Very rare: I only once came across it, when I found a dead bird in one of my fields, on the 15th September, 1860. I believe, however, that it is not uncommon in summer about Hazelwood, near Sligo, about thirty miles from this place.

(To be continued.)



ON THE CLAIM OF THE PINE GROSBEAK TO BE REGARDED AS A BRITISH BIRD.

BY J. H. GURNEY, JUN.

SOME time ago I set to work to examine into the claim of the Pine Grosbeak to be retained in the list of British Birds. I found that a good deal of misapprehension about it prevailed amongst the authors whose works I consulted, and my notes accumulated in proportion to my researches. My papers were then laid aside, in the hope that time might unravel some of the intricacies which baffled me. As I now see no prospect, however, of getting any further information on the subject, I willingly accede to the

suggestion of a friend, and send the result of my investigations to the present time for publication in 'The Zoologist.'

Mr. Harting, in his 'Handbook of British Birds' (p. 113), has given a list of nearly all the reported occurrences of the Pine Grosbeak in Great Britain, collected from various sources,* and one would suppose at first sight, from his long category, that there could be no doubt about the claim of this bird to be regarded as British. Many species, indeed, in that work have appended to their names far shorter lists of recorded occurrences, and have never been suspected to be interlopers. But on examining the list of Pine Grosbeaks, we perceive on what slender evidence a great many of them have been introduced. I think I cannot do better than follow Mr. Harting, and taking them *seriatim* as he gives them, state as fairly as I can the *pros* and *cons* in regard to each.

1. The Pine Grosbeak appears to have been first introduced into the list of British Birds by Thomas Pennant, the well-known author of the 'British Zoology.' In that work (4th ed., vol. i., p. 317) he says, "I have seen them flying above the great pine forests of Invercauld, in Aberdeenshire; and I imagine they breed there, for I saw them on the 5th of August." He adds that one that he "saw in Scotland and believed to be a female was (like the female Cross-bill) of a dirty green, the tail and quill-feathers dusky." Nothing has ever transpired to make us doubt the correctness of Pennant's identification of the species, which he has accurately described, except the rather significant fact that none are known with certainty to have been seen in Scotland since. This of itself, however, is not sufficient proof that the bird was not once found there.

2. In a catalogue of the rarer birds met with in the parish of Kirkmichael, in Dumfriesshire, by Dr. Burgess, published about 1792, the Pine Grosbeak is included; but Dr. Burgess' name is unknown to ornithologists, and what weight may be attached to his authority in the matter it is impossible to say. Professor Newton informs me that Kirkmichael is close to Jardine Hall, but that Sir William Jardine (who, as every one knows, was a very good naturalist), in writing on the fauna of Dumfriesshire, in the 'New Statistical Account of Scotland,' makes no mention of the Pine Grosbeak. Mr. Robert Gray, who I believe first drew attention to

* One or two others which were unknown to him at the date of his publication will be found mentioned at the end of this paper.

Dr. Burgess' Catalogue, has not been able to throw any light on the matter in his 'Birds of the West of Scotland.'

3. I have not seen Don's 'Fauna of Forfarshire,' but am indebted to Mr. Gray for the following extract from it (p. 43):—
" *Loxia curvirostra*, the Crossbill, and *enucleator*, the Pine Grosbeak. These two species of *Loxia* have come in great numbers to the woods of Glammiss and Lindertis, and totally destroyed the whole of the larch and fir-cones for these two years past." Don's 'Fauna of Forfarshire' was published in 1813: it is now impossible to decide whether he was competent to distinguish the species named by him or not.

4. In Ireland this bird is supposed, on the vaguest testimony, to have been once obtained. The following is Thompson's account of the specimen in his 'Natural History of Ireland' (Birds), vol. i., p. 275:—"In the manuscript journal of that eminent naturalist, John Templeton, Esq., is the following note:—‘December the 20th, 1819. Yesterday heard from Mr. Montgomery, of Belfast [the late Mr. John Montgomery, of Locust Lodge] that Mr. Bradford [a pump-maker] had received a specimen of *Loxia enucleator*, which was shot at the Cave Hill [vicinity of Belfast], and on showing [him] the figure in the ‘Naturalists Miscellany,’ he recognized it to be the bird.’" Mr. John Templeton died in 1827: ten years afterwards his son published a list of Irish Vertebrates, from materials found amongst his papers (Mag. of Nat. Hist., N.S., vol. i. p. 403), in which the Pine Grosbeak is mentioned as "a doubtful native," but no particulars are given of the specimen which was shot by Mr. Bradford at Cave Hill. I am told that the figure of the Pine Grosbeak in the 'Naturalists Miscellany' is a gaudy red picture. I have not seen the work lately, but, if I remember right, many of its plates might puzzle a better naturalist than Mr. Bradford, and I should be inclined to discredit his identification, if for no other reason than that he professed to have recognised the species from such a bad figure.

5. In Selby's "Catalogue of the Birds of Northumberland and Durham" (Trans. Nat. Hist. Soc. Northumb., 1831, p. 265) that author writes:—" *Strobilophaga enucleator*. Pine Grosbeak. A specimen of this rare British species, now in the possession of Mr. Anthony Clapham, was shot at Bill Quay, near Newcastle." This bird passed from Mr. Clapham to the late Mr. W. Backhouse, and is now in the possession of his son. It was lent to me some

years ago, and I had a photograph taken of it, which is now before me. It was a female bird, of a greenish yellow colour and in moult. The only objection which has been raised to its authenticity is the odd place where it was said to have been killed—*viz.* Bill Quay, near Newcastle. I do not know the locality myself, but we are accustomed to think of a “Quay” as a place where foreign birds are sold in cages. It is just possible that this Pine Grosbeak may have been a caged importation, in which case it might very well have been *got* there, though not *shot* there.* I have a note that, according to another account, it was obtained at Coble Dene, near Shields, but I have unfortunately mislaid the reference, and I have quite forgotten now what my authority for that change in the locality was.

6. It seems just possible that the flight of Pine Grosbeaks recorded in Paget’s ‘Natural History of Yarmouth’ (p. 6), as having “been seen on the Denes, Nov. 1822,” may have been confounded in some way with the Hawfinches, a large flight of which are stated by the same author to have appeared in the January following. We are not informed that any were captured; only a flight of them “seen,” by whom is not stated; but a person not well acquainted with birds, might perhaps mistake a flock of Hawfinches for Pine Grosbeaks.

7. In Lubbock’s ‘Fauna of Norfolk’ it is remarked (p. 36) that “a pair of the Pine Grosbeak (*Loxia enucleator*) are now preserved in Yarmouth, shot near that place, and which are said to have had a nest, which unfortunately was destroyed.” This I have no doubt is the same pair and nest alluded to in Gurney and Fisher’s ‘Catalogue of Norfolk Birds’ (p. 21) as occurring at Raveningham, near Yarmouth. As the authors knew the late Mr. Lubbock, they in all probability communicated with him on this subject. If the Pine Grosbeak was ever a British bird, it was probably only a winter or an autumn visitant, at any rate not a summer one, and it seems impossible to believe that it could ever have nested in Norfolk.

8. In September, 1694, according to a statement in Fox’s ‘Synopsis of the Newcastle Museum’ (pp. 65, 101), a flock of about a hundred birds visited a hemp-yard in Pembrokeshire, and destroyed all the hemp-seed. They were so tame, or intent on their feeding “that, being forced from their places, they would

* Mr. Selby, in the Catalogue referred to, says that the bird “was shot.”—ED.

not remove above two or three yards." It was not until nearly a century afterwards that the suggestion was made by Marmaduke Tunstall that they were Pine Grosbeaks (Fox, *l. c.*), but certainly the account as left by the observer—a Mr. Roberts—points rather to the Crossbill, although no mention is made of the beak, beyond the statement that it was "more stubbed and larger than a Bullfinch's."*

9. The Pine Grosbeak is named in Hastings' 'Natural History of Worcestershire' (p. 65), in a list of birds which "are all of unfrequent occurrence." The Great Black Woodpecker is named also, but as no particulars are given of the occurrence of either of them, this record may be dismissed without further comment.

10. Following the order in Mr. Harting's list, where the records are arranged chronologically, we now go back to North Britain. In the list of species to be found in the parish of Eccles, in Berwickshire, copied *verbatim* for me by Mr. Gray, from the Statistical Account of the Parish, the Pine Grosbeak is thus noticed by Dr. R. D. Thomson, who Mr. Gray tells me was a member of the Berwickshire Naturalists' Club, and for a long time resident in Glasgow:—"Besides about eighty common birds, the parish is occasionally visited by some rarer species; of these may be mentioned the *Columba turtur* (Turtle Dove), *Aquila albicilla* (Sea Eagle), *Corythus enucleator* (Hawk-finches), *Ardea nycticorax* (Night Heron), *Lanius excubitor* (Greater Butcher-bird)." The English name of Hawk-finches would lead one to think that a mistake had been made.

11. In Mr. Pemberton Bartlett's "Notes on the Ornithology of Kent" (Zoologist, 1844, p. 621), the reader is informed that the Pine Grosbeak has been "occasionally killed" in the county. Mr. Bartlett's informant was Dr. Plomley, who possibly may have referred to a pair of Pine Grosbeaks in the late Mr. J. Chaffey's collection of Kentish birds, which were said to have been killed in England, but on whose authority is not known.

12. Next we come to the late Mr. Yarrell's specimen, which is now the property of Mr. Frederick Bond, in whose collection I dare say many of the readers of 'The Zoologist' have seen it.

* From the original account by Lhwyd (Phil. Trans. xxvii. pp. 464 and 466) it is plain that the birds could not have been Hawfinches, as might be supposed from the description of the bill. The cocks were of a deep scarlet colour; the hens gray, with a scarlet breast.—ED.

Although the evidence about it is very incomplete, it is the best authenticated specimen I know of. Yarrell (*Brit. Birds*, ii. p. 9) tells us that it was shot some years prior to 1839 at Harrow-on-the-Hill; while Fox (*op. cit.*, p. 65), apparently referring to the same bird, speaks of it as shot at Wellwyn, in the adjoining county of Hertford. So good a naturalist as Yarrell appears to have been satisfied of its authenticity, and in the absence of any further evidence, one must accept his testimony.

13. In 'The Zoologist' for 1845 (p. 1025) the Rev. H. Clark states that he had a Pine Grosbeak which was killed "in a fir-plantation near Rochdale, Lancashire," in February, 1845. Mr. Bond has kindly informed me that he saw it several times, that it was a male bird, and that after Mr. Clark's death it was sold to a dealer. Mr. Clark being dead, it is now too late to obtain any further information about it.

14. In Knox's 'Ornithological Rambles in Sussex' (p. 211), two Pine Grosbeaks are stated to have been killed in Ashdown Forest in February, 1848. Although it was believed at the time that they had been killed as stated, Mr. Knox informs me, by letter, that he now almost begins to doubt them.

15. The same naturalist has recorded (*l. c.*) that another Pine Grosbeak was killed at Petworth. At this distance of time no further evidence is procurable.

16. In 1850 a Pine Grosbeak was seen at Corrymulzie, Bræmar, N.B., by the late Prof. Macgillivray, who, however, writes very cautiously and guardedly about it in his 'Natural History of Deeside and Bræmar' (p. 403).

17. The seventeenth reported occurrence is a mere name in the 'Proceedings of the Somersetshire Archaeological Society,' in Mr. Baker's Catalogue of the Fauna of that county. I applied to that gentleman's grandson to know if he could tell me what ground there was for including it, and he has obligingly informed me that it appears from his grandfather's papers that it was met with by Mr. Anstice, of Bridgwater, and also by the late Mr. Govett. As against this, I may remark that Mr. Anstice would most likely have communicated such an important fact to his friend Colonel Montagu for his 'Ornithological Dictionary,' who, however, has made no mention of it.

18. In a note on the occurrence of rare birds near Kingsbridge (*Zool.* 3474), Mr. Charles Prideaux states that a Pine Grosbeak

was lately (that is about 1851-2) killed at Taunton. Your correspondent, Mr. Nicholls, informed me some time ago that he saw the bird at the time, that it had been bought of a dealer, and that it looked to him as if it had been set up from the flesh. It may therefore rank with Mr. Bond's bird as one of the better authenticated specimens.

19. This record is the last mentioned by Mr. Harting (*op. cit.*), and refers to one seen at Dunkeld, N.B., by Col. Drummond Hay, as he told me when I had the pleasure of meeting him some time ago.

20, 21, 22. In addition to the foregoing, I have three more records to refer to, one relating to Lancashire, one to Hampshire, and one to Devonshire. In the first of these counties, the locality is Hulston, the date prior to 1837, and the recorder Mr. Rylands, on the authority of the late Mr. T. K. Glazebrook (*Naturalist*, 1837, p. 352). In the second, that is Hampshire, the locality is Thruxtion (*Zoologist*, p. 9023), but in this instance I have been informed by the recorder himself, that a mistake was made in the identification of the species. As regards the third, I learn from Mr. Byne of Taunton, that he is in possession of a Devonshire-killed Pine Grosbeak, but its history, so far as I can make out, after a good deal of correspondence with various parties, is not satisfactory.*

Mr. Gatcombe informs me that on the 8th November, 1868, the Rev. Mr. Furneaux saw a pair of Pine Grosbeaks feeding on the seeds of an *Arbor-vitæ* at St. Germains, in Cornwall, and felt sure about the species. I have a note of being told that it was included, on the authority of the Rev. G. Tugwell, in one edition of the 'Handbook of Devon,' in which is followed the excellent practice of some recent Guides to counties, of devoting a chapter to Natural History. I have two editions of this Handbook, but neither of them contain any such record.

In Mr. Gray's valuable work on the 'Birds of the West of Scotland,' already quoted, the Pine Grosbeak is mentioned as included in a list of the birds of the Esk Valley, in Midlothian; † and Mr. W. C. Angus has obligingly informed me that the Rev. J. M.

* Perhaps this is the same bird as No. 18.—ED.

† This list is contained in an anonymous edition of Allan Ramsay's 'Gentle Shepherd; a Pastoral Comedy,' published at Edinburgh in 1808 (vol. i. pp. 269—271). Dr. Patrick Neill is said to have drawn up the botanical lists contained in this work, but it does not appear who was responsible for the zoological lists.—ED.

Crombie, in his 'Braemar' (a work which I have not seen), refers to a supposed Pine Grosbeak that he saw near the Bridge of Dee at Invercauld.

Finally, in Prof. Newton's copy of Bullock's Sale Catalogue, which has MS. notes in it, in the hand-writing of some former naturalist,—possibly Dr. Latham,—a female Pine Grosbeak is included and marked as British. In the Sale Catalogue of Mr. Sealy, of Cambridge, also, I see that "Lot 59" is described as "Pine Grosbeaks, three in case, one shot at Doncaster, and one at Sheffield." Whether these were anything more than dealer's localities I am unable to say.

Having now enumerated a list of five and twenty so-called "occurrences" of this bird in Great Britain, I will proceed to weed out the most doubtful cases, and consider the claims of those that remain. In the first place, then, I dismiss all records in which the name of the bird is given without any particulars. I do the same with those included in the sale-catalogues, three in number. The remainder (fourteen in number) I divide into two classes, under the heads of "mistaken identity," and "mistaken locality." By mistaken locality I mean that the specimens in question were not killed in this country, as those who recorded them were led to believe.

Probable cases of mistaken identity:—3. Forfarshire; 4. Ireland (Belfast); 8. Wales (Pembrokeshire); 10. Berwickshire; 15. Sussex (Petworth); 20. Lancashire (Hulston).

Probable cases of mistaken locality:—7. Norfolk (Yarmouth or Raveningham); 11. Kent; 13. Lancashire (Rochdale); 14. Sussex (Ashdown).

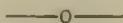
We have now only four left to deal with, and it appears to me that these are the most worthy of credit:—

1. The examples met with by Pennant in Aberdeenshire.
5. Mr. Backhouse's bird, obtained at Bill Quay, Newcastle.
12. Mr. Bond's bird, said to have been killed at Harrow.
18. The Taunton specimen of 1852, for the correct naming of which I have the authority of one of your correspondents, Mr. Nicholls.

I leave it to your able correspondent, the Rev. M. A. Mathew, to say what he can for the last-named specimen in his forthcoming work on the Birds of the West of England. As regards Mr. Bond's specimen, the only argument which can be used against it is the

possibility of its being an escaped importation ; and the same may be said of Mr. Backhouse's specimen. As regards the birds met with by Pennant, looking to the ease with which the Pine Grosbeak could fly to this country from its Scandinavian home, and the vast forests of pine in which to this day whole flocks might roam unnoticed and unmolested, I confess I see no great reason to discredit his account. Antiquated records of birds are generally incomplete, and in the case of the Pine Grosbeak this is especially the case, but because a few reports may be disproved, we are not therefore to discredit all. That it is not found here now is no proof that it was not once found here.

The conclusion at which I arrive is that if the Pine Grosbeak were now to be installed for the first time as a British bird, the evidence would scarcely warrant such a step ; at the same time the evidence is of such a kind that we are not justified now in rejecting it, especially as it has been standing in our lists for a great number of years, and has become firmly established there by the verdict of almost every writer on British Birds.



OCCASIONAL NOTES.

BREEDING OF THE OTTER.—I quite agree with Mr. Southwell, as regards the age of young Otters, that length would be much more reliable than weight (although I neglected to weigh three dead examples mentioned in my former letter), but think he will agree with me that it is practically impossible to measure a live Otter ; even with a perfectly tame individual or a young one the result would not be likely to be very accurate. In 'Land and Water' for June 8, 1867, Mr. James Lomax writes that he has hunted Otters for forty years, and found very young cubs in almost every month of the year. With regard to the four last examples mentioned in my former letter (p. 100), I should be glad to correct a misprint : seven lines from the bottom of the page, "one of" should be inserted between the words "me" and "these"; and two lines further on, "specimens" should be singular.—
A. H. COCKS (5, Radnor Place, Hyde Park).

BREEDING OF THE OTTER AND BADGER.—As any fact with regard to the habits or instincts of these two happily still indigenous British quadrupeds seems acceptable, I may add my mite, at least respecting the former animal, to the observations of Messrs. Cocks and Southwell (pp. 100, 172). I have only had young Otters sent me on two occasions, and not having my note-book with me I am not able to give the exact date, but one I know I received in January, and the other during the winter months. One

of these was not much longer than a good-sized Squirrel, but the other was more bulky and evidently older. This happened several years ago, and I did not take either the length or weight of the juveniles, but their occurrence at that season of the year is in favour of Mr. Southwell's conclusions as to the time of breeding. How long a time does it take the Otter to attain maturity? About the middle of November last a young Badger was sent from the New Forest to my house in Hampshire, but unfortunately I was away, and consequently it was not preserved; it was about a foot in length, but my friends did not weigh it. A friend of mine in the forest asked me how long a Badger went with young, as he had kept a female a year or more, and then she had young, but died soon after. I confessed my ignorance of the matter, and told him I believed the period of gestation was almost if not quite unknown. Has the time been proved with certainty? I quite believe, with Mr. Southwell, that the pairing of any animal in confinement is not of much value as an indication of what takes place in a state of nature, for we well know that domestication, or even semi-domestication, often has strange effects upon the creatures taken under man's careful supervision.—G. B. CORBIN (Ringwood, Hants).

BREEDING OF THE BADGER.—My Badger, which had her first family of one (a female) on February 27th, last year, presented me with another family on the evening of February 16th, this year. Naturalists will therefore be glad to learn that I can now settle that vexed question, the gestation of these curious animals, for this Badger has gone with young a year all but about seventeen days. I cannot say how many there are, for the apartment is a long hollow tree, which I cannot see far into. It was seven weeks before the young one turned out last year, and then its mother was very anxious that it should not be seen, and soon carried it back in her mouth. The reason I think there are several is from the music they make, which is very like that made by Ferrets. I have known a wild Badger have five young ones. It has been ascertained in Germany that the Roe has the power of suspending the time of gestation, and this seems to be the only way of accounting for the fact of wild-caught Badgers going as long as fifteen months with young.—F. H. SALVIN (Whitmoor House, Guildford). |

MARTEN CAT IN LINCOLNSHIRE.—I send the following account of a comparatively recent capture of a Marten-cat in Lincolnshire, as there are not many of our English counties that can still reckon this animal with any certainty among its fauna. It occurred in a large wood of more than five hundred acres, called South Wood, belonging to Mr. Thomas Drake, of Stainfield Hall. A cousin of mine, Mr. F. F. Morres, was shooting with a party of two or three others during the Christmas vacation of 1871-72 in the above-named wood, which was still famed as the haunt of Martens, one or more being generally killed there every winter. The owner has numerous specimens preserved in various attitudes. The party had been shooting all

the morning, and had made a very varied bag, the sport being doubly interesting in consequence of the wood not being regularly preserved, and being still the haunt of many an animal and bird, such as the Marten-cat and Buzzard, which would have received but scant mercy at the hands of most owners. Would that there were more such refuges for the destitute still to be found! They had sat down to enjoy—and what more enjoyable on such an occasion?—their *al fresco* luncheon, and had not been long so engaged, when one of the boys who had been beating cried out, “I see a Marten!” and sure enough there was a fine Marten-cat peering down upon them from a Squirrel’s “draw” just above their heads. There was a rush for the guns, but my cousin was quickest on his legs, and soon a fine male Marten-cat was lying at his feet, which now adorns his rooms as a memorial of a most pleasant excursion. I may add that up to this time this wood had been a well-known haunt of Martens, and although of course not plentiful, they are not considered rarities. I am afraid, however, this will not long continue to be the case, but I am sure that every one who is interested in the Natural History of our island will say with me, “The longer the better.”—A. P. MORRES (Britford Vicarage, Salisbury).

[We should be glad if any readers of ‘The Zoologist’ would enumerate any localities where the Marten-cat may yet with certainty be found.—ED.]

PURPLE GALLINULE IN NORTHAMPTONSHIRE.—In addition to the occurrences of the Purple Gallinule in the United Kingdom mentioned by Mr. Cecil Smith and yourself in the May number of ‘The Zoologist’ (pp. 227, 228), I beg to inform you that a very fine specimen of this bird was caught by a navvy on an embankment of the North-Western Railway, not far from Wellingborough, in Northamptonshire, and brought to me at Lilford, where it is now alive and well in my aviary. I am sorry that, as I have not my notes here with me, I cannot give you the precise date of this occurrence, but my impression is that it was early in 1873. This bird bore no traces of captivity.—LILFORD.

THE SOMERSETSHIRE PURPLE GALLINULE.—The facts forwarded to you by me relative to the occurrence in Somersetshire of the Purple Gallinule were supplied me by the owner of the bird, and by a gentleman who is his near neighbour. There can be no reason why their statements should not be received that one bird was captured and another seen. It is beyond me to understand on what grounds the Purple Gallinules, and some other birds, which have been obtained in this country should be set down as escapes. There is no antecedent impossibility in any bird that can fly finding its way to England; there is no great improbability in birds which belong to the South European or North African Ornis straggling occasionally to this country. It is not easy, it is well nigh impossible, to lay down any hard and fast rule, and to pronounce of one bird that it is an escape, of another that it can only be a genuine immigrant. Unless there are the easily-

detected signs of captivity, or some private markings about the bird, the presumption should be that it was "a *bonâ fide* traveller." And private markings have sometimes upset the reputation of specimens of birds which are generally admitted as British visitants without any question. We have known a Welsh Rough-legged Buzzard proved in this manner to be only an importation and subsequent escape. When one meets a Parrakeet, a Whidah-bird, or a Canary in its yellow plumage at large, it is justly concluded, from sufficient grounds, that these must in some manner have escaped from their cages; but with birds which are not commonly kept in confinement and which might without any very great difficulty wander to these shores, in the lack of proof to the contrary, one would be disposed to pronounce them wild birds and not escapes. Purple Gallinules have occurred several times in this country, as your editorial note informs us. Mr. J. H. Gurney, jun., has been good enough to acquaint me that the Norfolk example is the Green-backed Gallinule, *Porphyrio smaragdonotus*, a North-African species, and that the Irish specimen, which, through the kindness of Mr. J. Marshall has been added to my collection, is the Martinique Gallinule, which differs from the Purple Gallinule of South Europe in its somewhat smaller size. If all these Purple Gallinules are escapes, is it probable that none of the owners would have advertised the loss from their aviaries of so valuable a bird, and thus have furnished proof of the fact? I shall not hesitate to admit the Serin Finch, the Calandra Lark, and the Purple Gallinule in my 'Birds of the S.W. Peninsula,' any more than I should feel disposed to close its pages against the Hawk Owl, White's Thrush, or the Yellow-billed Cuckoo.—MURRAY A. MATHEW (The Vicarage, Bishop's Lydeard).

NOTE ON THE PORPHYRIO KILLED AT TATTERFORD, NORFOLK.—Having had an opportunity of examining the *Porphyrio* killed at Tatterford in October last, and mentioned at page 228 of the current volume of the 'Zoologist,' I think it well to mention that it is not a specimen of *P. hyacinthinus*, but of the nearly allied *P. smaragdonotus*; and I think it would be desirable that the other British-killed *Porphyrios* which have been referred to *P. hyacinthinus* should be carefully examined, with the view of ascertaining whether any of these examples are also in reality referable to *P. smaragdonotus*. The latter species is readily distinguishable from *P. hyacinthinus* by the greener tints of its plumage, especially on the back: it is a South African species, but it also inhabits Lower Egypt, as recorded by my son in his 'Rambles of a Naturalist,' p. 186. I may add that the Tatterford bird shows no signs whatever of having been kept in confinement.—J. H. GURNEY (Northepps Hall, Norwich).

ROOSTING HABITS OF THE STARLING.—During the past winter countless numbers of Starlings have been roosting every night in a wood on the left bank of the Liffey, about half-way between Lucan and Dublin. On

several occasions, a short time before sunset, I have watched flocks arriving from all directions to this roosting-place, and, when several miles away from it, have seen flocks flying towards it. Many of these flocks unite on arriving, and spend some time in sailing and wheeling about, as if waiting for the arrival of others before alighting in the laurels, which they do quite unexpectedly, for when wheeling about they suddenly sweep down almost perpendicularly into the wood. After this, when they have disappeared from view, the noise they make is so loud that it is heard at a distance of several hundred yards, although there is a fall of water close by. The noise may be described as a harsh, half-hissing and half-whistling sound, and resembles the sound of water rushing through a narrow channel; it is kept up until after it is dark, I suppose until they have done disputing about the places they are to occupy. The number of flocks and the size of many of them make it difficult to conjecture the probable number of birds that came to the place each evening, but I think there must have been at least from 200,000 to 300,000. An uncle of mine, who saw these assemblages oftener than I did, thinks that there were 1,000,000; but the difference in these estimates only tends to show the impracticability of arriving at the true number. I do not know when the Starlings began to frequent this wood, but am told it was in October; they quitted it in the first week of April. Several authors allude to instances of Starlings roosting in immense flocks, as though this practice was an uncommon one; but I have heard of several similar instances, and believe it is the usual habit of Starlings to roost together in great numbers during the winter half of the year. Mr. Gould, writing of the Starling, in his 'Birds of Europe,' says:—"They congregate in large flocks in autumn and winter. On the approach of evening many of these flocks unite, and before going to roost this immense body may be seen traversing, with undulating sweeps and evolutions, the immediate neighbourhood of their resting-place. They prefer for this purpose secluded and warm situations, such as thickly set reed-beds, coppices, or plantations of fir."—J. E. PALMER (Lucan, Co. Dublin).

CROSSBILL NESTING NEAR BOURNEMOUTH.—On March 16th a nest of the Crossbill was found by some boys in a fir tree on the outskirts of the town of Bournemouth. It contained four young birds, one of which escaped, one was killed with a stone, and two were brought to the bird-stuffer, Mr. Green. Their colour was a dull green with blackish streaks; the mandibles very slightly crossed: the note much the same as that of the old bird. The nest was made of sticks, moss, and wool.—G. J. DUMVILLE LEES (Woodhill, Oswestry).

[Many instances are on record of the Crossbill nesting in other parts of England, but this is the first occasion, we believe, on which it has been known to rear its young in Hampshire. One reason, doubtless, why the nest is not more frequently found is that the Crossbill breeds so very early

in the year, the young being hatched before many other birds have laid their eggs.—ED.]

BEARDED TIT AND HAWFINCH IN ABERDEENSHIRE.—Being in Aberdeen recently, I had the pleasure of visiting the Free Church College Museum, where I observed, in a case (said to contain birds of the locality), a splendid specimen of the Bearded Tit. On asking the keeper, Mr. Beaveridge, about its claim to be there, he told me that he himself had shot it at a place called Monymush, in the County of Aberdeen. I mention this fact because in all works on Ornithology to which I have access I find it stated that the Bearded Tit is not found in Scotland. In the same case I also noticed a fine Hawfinch, and was delighted to hear that it was procured in the same district as the Tit, and by the same individual.—THOMAS EDWARD (Banff).

[The Bearded Tit is included in Don's 'Fauna of Forfarshire' (1813), and a writer in Loudon's 'Magazine of Natural History' for 1830 states that he saw a bird of this species at Inchannan, in Renfrewshire, where the River Gryfe joins the Clyde. These are the the only records known to us of the occurrence of this bird in Scotland. As regards the Hawfinch, although unknown in the West of Scotland, it occurs in the southern and eastern counties, where it has been traced from Dumfriesshire to East Lothian, thence to Aberdeenshire, Banffshire, and Caithness, in all of which counties several specimens have been obtained. See Gray's 'Birds of the West of Scotland,' p. 144.—ED.]

NESTING OF THE BRAMBLING.—I think a statement of Mr. Mitchell's, in the 'Zoologist' for May is calculated to convey an erroneous impression. He states that the nests of the Brambling "are usually placed in the birch trees at heights of from four to eight feet, and the number of eggs never more than four." I have found several nests at double the greatest height mentioned, and I think the birds must have been laying when Mr. Mitchell found his nests, as, out of nine nests found by myself and friends in Norway only one contained so few as four eggs, and the bird was not sitting. The other nests contained respectively five, five, five, six, six, seven, and eight eggs. One of these nests may possibly have been a Chaffinch's.—JOHN P. THOMASSON (Alderley Edge).

MOORHEN DEFENDING ITS YOUNG FROM A STOAT.—Some time ago a parishioner of mine (Mr. John Gay Attwater), a keen observer of Nature, was walking by the side of the river, when he was attracted by the gambols of a newly hatched brood of Moorhens with their mother. While he was watching them the parent bird gave its peculiar sharp cry of warning, and the young ones scuttled under the friendly shelter of the bank in various directions. On looking about to discover the cause of alarm, he perceived a Stoat on the opposite bank of the stream to that to which the Moorhens had fled for shelter, which was sniffing up the air in

an ominous manner, having evidently scented his prey before him. After having settled to his own satisfaction the whereabouts of the Moorhens, the Stoat without hesitation entered the water, and began to swim across to the opposite bank ; but before he had half-way crossed the stream the old bird, which had been keenly watching her enemy's tactics, flew directly at him, and as she passed over struck at him with her long sharp claws, and turned him completely head over heels in the water. At this unaccustomed treatment the Stoat fairly turned tail, and returned to the bank from whence he had started. But he was not to be vanquished in a moment, and the scent of his prey being too alluring he once more started on his voyage, when once again the Moorhen courageously dashed at him, and treated him in an exactly similar manner, repeating her attacks in this way until the Stoat, being half-drowned, thought that discretion was evidently the better part of valour, and gave up the pursuit ; but his troubles were not then ended, as the farmer's gun prevented him from ever repeating a similar attempt.—ARTHUR P. MORRES (Britford Vicarage, Salisbury).

PARTRIDGES COLOURED LIKE RED GROUSE.—The Editor's remark, page 229, in connexion with this subject, was evoked partly by the omission, in a newspaper report which he had for reference, of the words "Not having seen Sir William's account" before the words (in the said report) "one is at a loss to know," &c. If this clause be inserted in the page referred to (ninth line from bottom), before the words "and he was at a loss to know," &c., it will, I think, somewhat modify the responsibility of my statement and apparent misquotation. I have taken the opportunity of amending it in the proof of the paper for the 'Proceedings of the Glasgow Natural History Society.'—JOHN A. HARVIE-BROWN (Dunipace House, Larbert, N. B.).

BUFF VARIETY OF THE SONG THRUSH.—A beautiful variety of the Song Thrush was shot in September last by Sir Henry Boynton, Bart., of Burton Agnes. It retains all the normal markings, but the colour is of a rusty buff or yellowish sandy hue throughout. I may perhaps mention that I have just such another one in my own collection, and always considered it a very rare variety. It is singular how many different birds change to this pale rufous colour. I have three Hedge-sparrows, one Redbreast (similar, though somewhat paler), and a Sky Lark, all of this hue, and have seen others.—F. BOYES (Beverley).

GREGARIOUS HABITS OF THE LONGEARED OWL.—If one scrap of evidence may be added to the testimony of Messrs. Gurney, Boyes, and Corbin, I may observe that I met a gentleman lately who assured me that the Long-eared Owl is often met with in small "coveys," but being rarer than the short-eared species it does not so often come under the observation of naturalists. He met with a small party of six individuals a little while

back in a fir-wood, and, as generally seems to be the case, could have shot them all; only one bird, however, was killed, being all that the shooter required for his collection.—C. MATTHEW PRIOR (Bedford).

THE CURLEW OF THE WILTSHIRE DOWNS.—Perhaps the remarks I am about to make have not much bearing upon the point at issue, as to the supposed nesting of the Common Curlew in Wiltshire (p. 183), but may serve as an illustration of how mistakes of the kind are made even by those whose knowledge naturally points to a different conclusion. Some few seasons ago an oologist—whose name I purposely reserve—paid me a visit, and having amongst other things looked over my small collection of eggs, I asked him if he saw any error in nomenclature; he replied, he had noticed one egg marked *Numenius arquata*, which certainly did not belong to the Curlew, it being much too large as well as of different markings; and he further added, that the eggs of the Curlew were taken not uncommonly on the downs in the neighbourhood of Winchester, &c. I suggested that he meant eggs of the Stone Curlew or Thick-knee; for Gilbert White, in his ‘Natural History of Selborne,’ mentions the breeding of that species in his day not very many miles from the same place, but my friend still held to his opinion that my large egg was not that of a Curlew. If I mistake not the downs in question form a continuation of those in Wilts, and if this is the case it seems somewhat remarkable that the same error has been committed in two separate instances. Whether my friend has ever altered his opinion I am unable to say, yet, if this should meet his eye, no doubt he will remember the incident, and will perhaps give us a note on the subject.—G. B. CORBIN (Ringwood, Hants).

RED-WINGED STARLING IN YORKSHIRE.—On March 31st last, while on an entomological tour between Askern and Barnsley, just after leaving Adwick-le-Street and crossing the Pontefract and Doncaster turnpike-road, I saw laying among the grass on the roadside what I took to be a dead Blackbird; but, on picking it up to examine it, I found it to be a fine male of the above species; it had apparently flown against the telegraph wires during the night. This rewarded me for the otherwise fruitless journey.—S. L. MOSLEY (Primrose Hill, Huddersfield).

[This makes the tenth recorded instance of the occurrence of the American Red-winged Starling in the British Islands. For the other nine, see ‘Hand-book of British Birds,’ p. 117.—ED.]

NOTE ON THE WILLOW WREN.—Notwithstanding the intensely cold weather which we had early in April, the willow warblers arrived here in their usual abundance. One was seen for the first time on April 12th, and by the 15th they were somewhat plentiful, although not generally distributed, owing no doubt to the cold wind, which induced them to affect such localities as were screened. It may be noted that I never heard their song from their arrival until the 19th April; on the 20th, however,

their clear, sonorous notes may be heard almost in every grove. I saw a Pied Wagtail for the first time on March 10th; a few hen Chaffinches on the 18th; and a friend told me he observed a female Wheatear on April 1st. I believe the females generally make their appearance a few days before the males.—E. P. P. BUTTERFIELD (Wilsden).

[Our correspondent's observation with regard to the Willow Wren confirms a remark which we have before had occasion to make, namely, that the song of a summer bird, when heard for the first time, does not always indicate that the author of it has only just arrived; on the contrary, for the reason above stated and from other causes, the bird may have been here many days before announcing its presence by a song.—ED.]

BLACKCAP'S NEST SUSPENDED IN A FIR TREE.—I came across a very unusual site for a Blackcap's nest last summer, well illustrating the old proverb that "Necessity is the mother of invention." This bird, as every one knows, usually builds amongst brambles, grown through with nettles, &c., but in this instance a marked deviation from the usual mode had been resorted to. In a fir plantation, consisting chiefly of spruce without any underwood (indeed nothing will grow beneath spruce), a Blackcap had suspended its nest in the hollow formed by the downward growth of the spring shoots of a spruce branch stretching out from the tree and a few feet from the ground, exactly in the manner of the Goldcrest.—F. BOYES (Beverley).

BLACK-THROATED DIVER ON FRESH WATER.—A female Black-throated Diver was shot during the third week of April on a fresh-water pond at Trengwainton, which as the crow flies is about a mile from the sea. The Divers are oceanic in their habits; and at this season of the year, when mackerel and other fish are abundant, it is curious that the bird in question should have strayed inland to the pond referred to. We never see the Black-throated Diver in its full speckled plumage with black throat, but we get the other two species occasionally in full ornate plumage. The Black-throated Diver is much the rarest of the three.—EDWARD HEARLE RODD (Penzance).

[Our correspondent's remarks are no doubt accurate enough as regards Cornwall, but will not apply to Scotland, where both the Black-throated and Red-throated Divers are eminently fresh-water species. There is, perhaps, scarcely a loch of any size in the north and west of Scotland that is not tenanted, for a considerable portion of the year, by one or more pairs of Divers.—ED.]

ROUGH-LEGGED BUZZARD AND PEREGRINE FALCONS AT HARWICH.—A beautiful dark-coloured specimen of the Rough-legged Buzzard was shot here in November last; and in December two female Peregrine Falcons were shot on the River Stour—one in the act of stooping at some Sea Gulls; the other, after it had pounced on a Wood Pigeon flying across the river, which it carried to the shore and there killed by tearing out the windpipe and breaking the neck at the back of the head; it was extremely

fearless, as it allowed the person who shot it to approach as near as he liked.—F. KERRY (Harwich).

LITTLE GULLS AND KITTIWAKES IN ESSEX.—On the 29th December, 1876, an immature specimen of the Little Gull, and on the 8th January, 1877, a mature bird of the same species, was shot in the Harwich harbour. The old bird had lost a portion of the upper mandible, and the wound appeared to have been of long standing, as the lost portion was being reproduced. On the 11th January last a mature Kittiwake was shot on the River Stour; and on the 12th February an immature bird of the same species was seen to alight in a farm-yard at Great Oakley, where it was caught, being too exhausted to fly further, and being literally nothing but feathers and bones.—ID.

LITTLE BITTERN IN GUERNSEY.—In November last a Little Bittern was caught in the Vale Road, Guernsey, and brought alive to the shop of Mr. Couch, the bird-stuffer. I did not see the bird at the time, but it has since been sent over to me: it is a young bird of the year, and Mr. Couch informs me a male by dissection.—CECIL SMITH (Bishop's Lydeard).

NIGHTINGALES IN BRITTANY.—I have been reading your interesting book ‘Our Summer Migrants,’ and have just come across a notice of the Nightingale, at page 34: at the bottom of the page you say, on the authority of Mr. Blyth, “There are none in Brittany.” Some fifteen years ago, one May night, there were plenty. In the evening I left Nantes, near St. Malo, in one of those odd little conveyances common to country parts of France. I was with a Scotch cousin who had never heard a Nightingale; well, we jogged along, much cramped, weary and hot, far into the night. On nearing Chateaubriant the little conveyance was stopped at the foot of a steep hill, for all to walk up. There was a forest on each side of the road—it was a dark, still night; both sides of the road, among the trees, seemed to be alive with Nightingales singing their loudest. You may imagine my Scotch cousin’s astonishment, he being a keen observer of such things. I was so impressed with the circumstance that I cannot forbear writing to you to contradict Mr. Blyth’s statement, as I know the Nightingale’s note well; and, at the time we heard it, no other birds in that place could have been singing as they did.—H. V. M. WILSON (33, Spencer Road, New Waudsworth).

BIRDS IMPALED BY THE WIND ON WEATHER VANES.—At page 271 of the ‘Zoologist’ is a letter from Mr. A. P. Smith about a Woodcock which struck against the vane of a church at Ipswich, and was impaled on the arrow. As some may hardly have credited so extraordinary a story, I may quote a corroborative account from the ‘Manchester Courier’ of a similar accident to a Jackdaw:—“During the recent gales the inhabitants of Aspatria were surprised to observe a dark-looking object attached to the end of an arrow-shaped vane on the summit of the lofty tower of their church. On a nearer examination it proved to be the lifeless body of a

Jackdaw, which the violence of the wind had driven upon the arrow and literally impaled." The one story corroborates the other.—J. H. GURNEY, Jun. (Northrepps Cottage, Norwich).

CUCKOO LAYING IN A SWALLOW'S NEST.—The Cuckoo's egg I mentioned to you as having been deposited in the nest of a Swallow was taken by one of my boys from a nest built under the bridge in Cassiobury Park. I have never met with or heard of another instance of this egg being found in a Swallow's nest, nor do I think that the fact is recorded in any book on Natural History. The small size and peculiar position of the nest preclude the possibility of the egg having been laid *in* it in the ordinary manner, and I do not doubt that it was conveyed there in the Cuckoo's mouth. I believe this mode of depositing the egg to be the ordinary one adopted, as few of the nests selected would admit of so large a bird sitting *in*, or even *on* them.—GEORGE ROOPER (Nascott, Watford).

[At pp. 222, 223 of 'Our Summer Migrants' will be found lists, from various authentic sources, of the birds in whose nests the egg of the Cuckoo has at different times been found. The number of species amounts to *fifty-six*, but the Swallow is not included. The instance above narrated by Mr. Rooper is the first of the kind that has come to our notice, and is extremely interesting.—ED.]

KITE AT NORTHREPPS, NORFOLK.—This afternoon (May 2nd) I saw, at Northrepps, a Buzzard going south, and immediately afterwards a second, and then a Kite. I was very much surprised at seeing the Kite, although it is not long since my father saw one at Northrepps; and it was still more unusual to see it so late in the year in company with Buzzards migrating southwards. They were high up, but the sky was very clear, and I could plainly see the light head and forked tail of the Kite, and observe every now and then the tail turned rudderwise.—J. H. GURNEY, Jun. (Northrepps Cottage, Norwich).

CORRECTION OF AN ERROR.—In my 'Notes from Beverley,' p. 157, in mentioning the note of the Spotted Crake, I am made to say—"The males begin to call at dusk like Corn Crakes or Quails, only the note is very different, and may be imitated by pronouncing quickly the word 'gluck'—'gluck' every three or four seconds." Please read "quick"—"quick" for "gluck"—"gluck," as the latter would make it very like the note of the Quail, which bird I frequently hear in the summer here; though when the corn is reaped they seem to leave us, judging by the very few that are killed in the shooting season. I should liken the notes of the Quail to "ghut, ghut it"—"ghut, ghut it."—F. BOYES (Beverley).

INTRODUCTION OF FOREIGN LAND AND FRESH-WATER MOLLUSCA.—With reference to the occurrence in this country of foreign land and fresh-water shells (p. 232), I may mention that they are now very frequently introduced. I myself turned loose on a moor in the county of Durham,

some twenty-five years ago, several specimens of *Helix villosa* which I had brought alive from Switzerland, and I know that they or their posterity were living in the same place ten years later. I saw a few weeks ago a couple of splendidly-grown *Parmacella*, which had been found in a garden near Newcastle, and which will doubtless, if they are properly fed, establish a colony in our neighbourhood. These, of course, must have been introduced accidentally with plants; but many other species have been intentionally transplanted. A friend of mine, many years ago, brought a number of *Helix lapicida* from the South of England, and established them on some rocks on the banks of the Wear: they are now one of our recognized local species. I have also turned out *Clausilia*s from Africa and from Syria, and various species of *Helix* from the latter country, in suitable localities in the county of Durham. But the latter perished the first winter: they could protect themselves against heat better than cold. Knowing how rapidly gasteropods modify under differing conditions, it may be interesting to note in what time, if in any, a change takes place in these new colonists. Fresh-water shells are transported, I believe, on the feet and tarsi of ducks and waders, in those cases—as in *Physa*, *Limnaea*, &c.—in which the ova have a glutinous covering. I once shot a mallard a hundred miles away from water, in the Sahara, and noticed the ova of some mollusk—probably *Succinea*—adhering to one of its feet. I suspect it will not be very difficult to extend the catalogue of British Land Shells, just as it has been for three-quarters of a century swollen by the addition of *Bulimus Goodallii*—a common West Indian shell now acclimatized in our greenhouses.—H. B. TRISTRAM (Durham).

BREEDING SEASON OF THE EDIBLE CRAB.—With regard to the time of year at which the Edible Crab (*Cancer pagurus*) spawns, I may observe that my friends at Porthgwarra, Messrs. Jackson, put female crabs into their large tanks there in December last, having the spawn developed under the apron; and on taking them out again, on 15th February last, found that all had shed their spawn. This agrees with the fact already known, that impregnation takes place with this crab about August and September.
—THOMAS CORNISH (Penzance).

LOBSTER BURYING ITS PREY.—Towards the end of February last we had occasion to empty a tank containing flat-fishes, and a flounder of eight inches in length was inadvertently left buried in the shingle, where it died. On refilling the tank it was tenanted by three lobsters (*Homarus marinus*), one of which is an aged veteran of unusual size, bearing an honourable array of barnacles; and he soon brought to light the hidden flounder, with which he retired to a corner. In a short time it was noticed that the flounder had disappeared. It was impossible the lobster could have eaten it all in the interim, and the handle of a net revealed the fact that, upon the approach of the two smaller lobsters, the larger one had buried the flounder beneath

a heap of shingle, on which he now mounted guard. Five times within two hours was the fish unearthed, and as often did the lobster shovel the gravel over it with his huge claws, each time ascending the pile and turning his bold defensive front to his companions. I am not aware that this canine propensity of the lobster has been before recorded.—ERNEST E. BARKER (Rothesay Aquarium, Bute):

DR. BOWERBANK'S COLLECTION OF SPONGES.—We are glad to hear that the entire collection of Sponges and microscopical preparations left by the late Dr. Bowerbank have been purchased by the Trustees of the British Museum. This collection, which comprises the specimens referred to and described by Dr. Bowerbank in his four important volumes published by the Ray Society, will be most useful and valuable to all who are interested in the examination and study of the *Spongiidae*.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

April 5, 1877.—Prof. ALLMAN, F.R.S., President, in the chair.

Capt. Chimmo, R.N., Westdown, Weymouth; the Rev. J. Constable, M.A., Agricultural College, Cirencester; and Prof. Liversidge, F.G.S., University, Sydney (New South Wales), were elected Fellows of the Society.

Mr. Collett, of Christiania, read a communication "On *Myodes lemmus* in Norway." This Scandinavian naturalist's observations on the habits and economy of the Lemming had extended over several years, and in 1876 he had published these in a Norwegian scientific periodical. Since then his attention had been called to Mr. Crotch's contributions in the Linnean 'Journal,' and, as in many particulars he differed from that author, the result was his present remarks on the subject. He stated that the number of young at a birth vary from three to eight, and two sets are annually produced. He regards their wandering propensities as a necessary consequence of their temporarily strong vitality, together with an inherent migratory instinct. The tendency, at intervals, to appear in unusually large numbers is not confined to the genus, but is common to all the species of the sub-family *Arricolinae*.* The majority of the wanderers are young, and in one instance, observed by himself, were chiefly males. The migration closes with the death of the individuals, generally brought about by an epizootic disease, the result of over-population, for the denser the masses the higher the rate of mortality. The bare patch on the rump, considered by Mr. Crotch to be due to the habit of protecting themselves against stones in resisting attack, Mr. Collett states is the result of a skin

* See the remarks of Mr. Henry Reeks, "On the Occurrence of the Lemming in Newfoundland," in the February number of 'The Zoologist,' p. 47.

disease, and not from the above acquired habit. He, however, supports Mr. Crotch's statements as to the number and kinds of predaceous birds and mammals which, as enemies, devour the Lemmings wholesale, and also that, by a perversion of taste or otherwise, both domestic cattle and Reindeer destroy them. Their occasional enormous increase in numbers our Scandinavian field-naturalist holds is owing to periodic prolific years, to the facility of rearing their young, and to their remarkably easy reproductive faculty. Parallel instances among other groups of animals—for instance, unusual swarms of butterflies, locusts, &c.—are well known, though as to the true reason of such departures in number, &c., much that is averred is only conjectural. Coincident with the notable years of the Lemming's migrations, the increase above the normal numbers of rats, mice, shrews, and even the grouse tribe, have been recorded. Mr. Collett affirms that the Lemmings travel chiefly in the direction of the valleys, and not constantly due west, as has been asserted: their great movements *en masse* are chiefly nocturnal. He is inclined to question Mr. Crotch's theory of a hereditary search for a lost "miocene *Atlantis*," and is rather of opinion that, in accounting for the periodical excess of multiplication and migratory impulse, a physiological necessity impels them; the nature of this is at present beyond our power to explain rationally and with certainty.

A further contribution to the Natural History of Swine, by Professor Rolleston, was read in abstract, this paper forming an appendix to that previously brought under the notice of the Society. The additional information is in the main confirmatory of the views already expressed by the author; but several important facts,—to wit, relative to the striping of the young of *Sus celebensis* and *S. verrucosus*, according to Dr. A. B. Meyer,—with information from other naturalists on kindred points, necessarily cause a modification of the conclusions formerly drawn.

The following botanical papers were read or referred to in abstract:—"On a Collection of Ferns made by Miss Gilpin in the Interior of Madagascar," by Mr. J. G. Baker. "Freshwater Algae of the Cape of Good Hope," by Prof. Reinsch. "On South-African Liverworts (*Hepaticæ*)," by Mr. W. Mitten. "On some New Irish Lichens," by the Rev. W. A. Leighton.

April 19, 1877.—GEORGE BENTHAM, Esq., F.R.S., in the chair.

A paper was read by Dr. Francis Day, "On the Geographical Distribution of Indian Fresh-water Fishes" (Part II. The *Siluridæ*). These, the so-called Sheet-fishes, form a large family amongst the *Physostomi* of Asia. Mostly scaleless, their mouths are provided with sensitive feelers, which, serving as organs of touch, assist them when seeking for their prey in turbid waters. Vision in such localities would be but of slight service, and, as might be anticipated, their eyes are comparatively small, whilst with advancing age these organs become atrophied, or at least do not increase in the same ratio

or so rapidly as the other parts of the body. In addition to augmented facilities for feeling about in muddy water, they have a considerable development of the auditory organs, which doubtless must be of essential use to them. Their power also of employing the air-vessel as a float appears to be subservient to that of hearing; living as they do a life of ground-feeders, this organ is more serviceably restricted to acoustic purposes. These fishes are almost absent from the clear waters of the Red Sea; they are more numerous in the turbulent coasts of Beloochistan, and at the mouths of the larger rivers and marine sand-flats off Sind and India, especially those of Bengal and Burma. They are comparatively rare in the open sea; in fact at the Andamans they become scarce, except such species as reside where small streams empty themselves into muddy creeks. On the other hand, in the turbid sea near Moulmein and amongst the islands of the Mergin Archipelago they abound. Siluroids likewise are found from the sea coast to the base of the Himalayas; but as they generally deposit their ova in the waters of the plains, and not (like many carps) in the rivers of the sub-Himalayan range, they very sensibly diminish on nearing the hills, though a few find a home in the upland waters. These latter genera are provided with an adhesive apparatus on the thorax, enabling them to adhere to stones, and preventing them from being carried away by the force of the stream. In these the barbels are short and the air-vessel enclosed in bone. The *Siluridae* are well provided with weapons of offence and defence, viz. strong dorsal and pectoral spines, often serrated. Wounds from these spines are regarded by the natives as poisonous. In some districts, indeed, rules are enforced against bringing these fish to the market with their spines intact. It is doubtful, however, if the East-Indian Siluroids possess a distinct poison apparatus, though often ugly sores arise from wounds inflicted by the serrate spines. There is a great difference in the manner in which the different kinds deposit their ova, some few carrying the latter in their mouths. Reviewing the distribution of the different genera and species, Dr. Day shows that seventy-five species are restricted to the Indian Region, including Burma and Ceylon; six are distributed from the Indian Region, excluding Ceylon, to the Malay Archipelago, and one extends from Ceylon to the Malay Archipelago. Consequently one species, and therefore only one genus, of Indian fresh-water Siluroid extends its range to Africa, whereas six reach the Malayan Archipelago. So far results would appear to show that the present race of fresh-water fishes of India is much more closely related to a Malayan than to an African fish-fauna.

In the absence of the author, the Secretary read two papers by Captain Chimmo, R.N. One of these detailed the native mode of dragging for the beautiful Siliceous Sponges (*Euplectella*) by the natives of the Philippines, and on points concerning their structure; the other was a short description of a supposed new species of Rhizopod.

Two botanical papers of interest were likewise laid before the meeting:—“On the Geographical Distribution of the *Meliaceæ*,” by M. Cassimir De Candolle; and a “Note on the Disarticulation of Branches,” by Mr. R. Irwin Lynch.

May 3, 1877.—Prof. ALLMAN, F.R.S., President, in the chair.

Mr. James Paton, of the Kelvin Grove Museum, Glasgow, was elected a Fellow.

The demise during last year of three veteran Biologists, Von Baer, Brongniart, and Ehrenberg, having caused vacancies in the list of Foreign Members, the following gentlemen, at this meeting, were duly elected among the honorary fifty holding membership:—

M. Pierre Du Charte, of Paris, a botanist of great repute, distinguished alike for his valuable memoirs on physiological and teratological as well as other branches of Botany.

Prof. Carl Gegenbaur, of Heidelberg (formerly of Jena), whose labours and philosophical investigations into the structure and development of both vertebrate and invertebrate animals mark him as one of the greatest comparative anatomists of the day. His researches on the *Heteropoda* have laid the foundation of our knowledge of this group. His monograph ‘On the Shoulder Girdle of Vertebrates’ is now a classic, and the ‘Grundzüge der Vergleichende Anatomie’ has no equal as a text-book, considering the original views therein, and as an exponent of the present stand-point of a philosophical Zoology.

Prof. Rudolph Leuchart, of Leipzig, chiefly distinguished for his studies on the morphology and physiology of the lower groups of animals. His researches on the *Siphonophora*, the *Ctenophora*, the parasitic and other worms have largely contributed to a knowledge of these forms. He was the first to show the necessity for the dismemberment of Cuvier’s group of the *Radiata*, which resulted in the establishment of the group *Cælenterata*. In the ‘Archiv fur Naturgeschichte’ his valuable annual prospects of the progress of knowledge in researches among the lower Invertebrates have been of immense assistance to zoological co-workers.

The first paper read and discussed was “On the Sacral Flexus and Sacral Vertebræ of Lizards,” by Prof. Mivart and Prof. R. Clarke. It has of late been recognized that in any attempt to answer the question, which vertebra of any lower animal answers to the first sacral vertebra of man, the nervous distribution quite as much as the bone relations require ample consideration. The authors discuss the researches of Professors Gegenbaur and Hofmann, and then proceed to describe their own dissections of the parts in question in the Chameleon, the Green Lizard, the Common Teguixin, the Iguana, the Monitor, and others. Afterwards they institute

a comparison of the parts in the *Batrachia*, and of the sacral region in certain groups of the birds, and, in a somewhat technical summary, state their belief that, although often very puzzling and complicated from occasional variations in species and otherwise, the true sacral vertebræ may be defined in all Vertebrates above fishes where hind limbs are well developed.

A contribution on Corals, *viz.* "Notes on the genus *Alveolites* (Lamarck) and on some Allied Forms of Palæozoic Corals," by Prof. H. Alleyne Nicholson and Mr. Robert Etheridge, Jun., in the absence of those gentlemen, was read by the Secretary. It seems, according to these authors' researches, that the name *Alveolites* covers a multitude of forms which are not always united by relations of genuine affinity; even definition of the so-called type-forms are subject to different interpretations. To clear difficulties examination of a large series has been instituted, and microscopic sections, whenever available, have been made and carefully compared. Discussing the characters and attributes of the genus, and placing the question in its historical aspect, they proceed by taking the affinities of the several species in groups:—

Group A.—*Alveolites suborbicularis* (Lamarck), along with which may be placed *A. compressa* (Edw. & Ham.), *A. Labechii* (E. & H.), and *A. Grayi* (E. & H.); these agreeing, however, in many respects with the genus *Favosites*.

Group B.—*Cermites* (Eichwald): not easily separated from the foregoing.

Group C.—*Brachypora* (Lindström). The *A. Fischeri* (Bill.) and *A. frondosa* are referable to this genus.

Group D.—*Alveolites septosa* (Fleming), with which they add *Chaetites radians* (Fisch.) and *A. depressa* (Flem.) as natural allies.

Group E.—*Chaetites* (Fisch.), with *Monticulipora* (D'Orb.) and *Stenopora* (Lonsd.), have much in common with *Alveolites* and *Favosites*.

Group F.—*Alveolites Goldfussi* (Bill.), with which *A. Rümeri* is allied, comes near *A. Tongti* (E. & H.), which latter Lindström puts with *Favosites*; but further investigation is necessary as to these latter.

Mr. Alfred W. Bennett exhibited and made remarks on some specimens of abnormal primroses; and Mr. G. S. Boulger read a short paper on the perfoliate pennycress (*Thlaspi perfoliatum*).—JAMES MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

April 17, 1877.—OSBERT SALVIN, Esq., F.R.S., in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of March, and called particular attention to a collection of rare Himalayan *Passeres*, purchased March 8th,

embracing examples of several ornamental species new to the Society's Collection, and two young male Orang-outangs (*Simia satyrus*), presented March 13th, by Dr. R. Sim.

The Secretary exhibited and made remarks on some young Anacondas, which had been produced dead by the large female Anaconda purchased on the 15th February.

The Secretary exhibited some photographs of the young Gorilla, now living in the Berlin Aquarium, and made some remarks on what, it now seemed certain, was an example of this ape, which was formerly living in one of Wombwell's travelling menageries, and was after its death transferred to the late Mr. C. Waterton's collection.

A letter was read from Mr. W. A. Willes, in which he gave an account of the success which had attended the endeavours of the Acclimatisation Society at Christchurch to introduce Salmon into New Zealand from the United States.

A communication was read from Mr. W. A. Forbes, containing a description of the peculiar organ known as the *Bursa Fabricii* in birds, and of its variations and modifications in the different genera of the class which he had had an opportunity of examining.

A communication was read from M. L. Taczanowski, in which he gave a list of the birds collected in North-Western Peru in 1876 by Messrs. Jelski and Holzmann. Amongst several new and interesting forms described was a new genus and species of *Fringillidæ*, proposed to be called *Gnathospiza Raimondii*.

A communication was read from the Rev. R. Boog Watson, containing some notes on the Madeiran mollusk identified by the Rev. R. T. Lowe as *Achatina folliculus*.

A communication was read from Mr. E. P. Ramsay containing the concluding portion of his list of birds met with in North-Eastern Queensland, chiefly at Rockingham Bay.

A communication was read from Dr. Otto Finsch, containing a preliminary account of the birds collected during his recent journey in the North-Eastern part of Turkestan.

A communication was read from Prof. Owen, containing the description of a new species of extinct Kangaroo of the genus *Sthenurus*, which he proposed to call *Sth. minor*, together with some remarks on the relation of this genus to *Dorcopsis*.

M. Edgar A. Smith read a paper containing descriptions of new species of South-American *Helicidae* in the British Museum.

The Marquis of Tweeddale gave descriptions of four new species of birds from the Indian region. These he proposed to name as follows:—*Trichostoma leucoprocta*, *Chrysococcyx Limborgi* and *Pomatorhinus Austeni* (from Tenasserim), and *Brachypteryx Buxtoni* (from Sumatra).

Mr. Osbert Salvin exhibited and pointed out the character of a new genus and species of bird of the family *Ampelidae*, from Costa Rica, and proposed to call it *Phainoptila melanoxantha*.

May 1, 1877.—Prof. NEWTON, F.R.S., Vice-President, in the chair.

Mr. Howard Saunders exhibited and made remarks on some nests and eggs of the Orphean Warbler (*Sylvia orpheus*), from the vicinity of Malaga, Spain. Amongst the eggs in each nest were one or two of larger size, supposed to be possibly the eggs of the Cuckoo. Mr. Howard Saunders also exhibited two skins of Dupont's Lark (*Certhilauda Duponti*) from the same locality.

Prof. St. George Mivart read a paper on the axial skeleton of the *Pelecanidae*, selecting *Pelecanus* as his type and standard of comparison. Prof. Mivart first compared it, as regards its axial skeleton, with *Struthio*, and other *Struthionidae*, and then compared the other *Steganopodes* with it and with one another.

A communication was read from Dr. M. Watson, Professor of Anatomy, Owen's College, Manchester, on the anatomy of *Hyæna crocuta*, in which he described the very peculiar conformation of the female generative organs of that animal.

Mr. A. G. Butler read a paper wherein he gave the description of two small collections of Heterocerous Lepidoptera, from New Zealand, recently brought to England by Dr. Hector and Mr. J. D. Enys.

A communication was read from Dr. O. Finsch, giving an account of a small collection of birds from the Marquesas Islands. Amongst these were three examples of a new species of Kingfisher, proposed to be called *Haleyon Godeffroyi*.

A communication from Mr. Frederick Smith contained descriptions of four new species of *Ichneumonidae* in the collection of the British Museum. Amongst these was a new *Bracon*, remarkable for having its ovipositor more than nine times the length of its body. This was proposed to be called *Bracon penetrator*, and had been received from Yokohama, Japan.

Prof. A. H. Garrod read some notes on the anatomy and systematic position of the genera *Thinocorus* and *Attagis*, which he considered should be referred to the *Limicola*, in the neighbourhood of *Glareola* and *Cursorius*.

May 15, 1877.—Prof. MIVART, F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of March, and called particular attention to a Ceylonese Fish-Owl (*Ketupa ceylonensis*) from Ceylon, presented April 4th by Capt. H. B. Turner; a female Antelope of an uncertain species, transmitted by the Sultan of Zanzibar, along with other animals, to the Prince of Wales, and deposited by His Royal Highness in

the Gardens on April 24th; a Pigmy Marmozet (*Hapale pygmæa*), purchased April 27th, and stated to have been obtained at Pebas on the Upper Amazons, and two Yellow-thighed Parrots (*Caiaca xanthomera*), new to the collection, received along with the Marmozet from the Upper Amazons.

Mr. Sclater made some remarks on the progress and condition of the Zoological Gardens of Rotterdam, Amsterdam, Antwerp, Brussels, and Ghent, which he had just visited.

A communication was read from Mr. G. S. Brady, containing a monograph of the fossil *Ostracoda* of the Antwerp Crag.

A communication was read from Dr. F. Day, containing a notice of the capture of a specimen of *Coregonus oxyrhynchus* on the coast of Lincolnshire.

A communication was read from the Marquis of Tweeddale, containing a memoir on the birds of the genus *Batrachostomus*. The author came to the conclusion that there were seven recognizable species of this difficult group, inhabiting the Indian Region, one of which, yet undescribed, was from the Philippines. The rule appeared to be that the females were rufous from the nest, while the males are brown and sometimes spotted.

Mr. Edward R. Alston read the description of a Shrew, from Guatemala, which had been indicated without being characterized by the late Dr. Gray, and for which the name of *Sorex veræ-pacis* was now proposed.

Prof. A. H. Garrod read the second portion of a series of papers on the anatomy of Passerine Birds.

A communication was read from Mr. T. E. Buckley, containing additional remarks on the past and present Geographical Distribution of the larger Mammals of South Africa.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

April 4, 1877.—Prof. WESTWOOD, M.A., F.L.S., President, in the chair.

Mr. George Harding, of Stapleton, Bristol; Mr. Charles Adolphus Briggs, of 55, Lincoln's Inn Fields; and Mr. John T. Carrington, of the Royal Aquarium, Westminster, were balloted for and elected Ordinary Members.

Mr. E. Howard Birchall, Mr. T. D. Gibson Carmichael, Dr. Edward Capron, and Mr. Valentine Cluse were balloted for and elected Subscribers.

The Secretary exhibited a collection of fine species of Lepidoptera from Siam (about twenty miles from Bangkok), forwarded to him by Mr. R. Garner, of Stoke-upon-Trent.

Mr. M'Lachlan exhibited a specimen of *Ophideres materna*, a brightly-coloured exotic species of *Noctuidæ*, given to him by Mr. R. H. Scott, of the Meteorological Office, with a note to the effect that it was taken at sea in lat. $25^{\circ} 24' S.$, long. $62^{\circ} 10' E.$ (the nearest land being the island of

Mauritius, about 360 miles distant), by Captain Raeburn, of the ship 'Airlie.' The moth is a common Indian species, but is found also in Africa. A specimen was long ago received from Brazil, and Mr. Grote had recently noticed its occurrence in Florida.

Mr. M'Lachlan also exhibited a cocoon and pupæ of a species of *Cetoniidæ* (probably *Diplognathus silaceus*) from Cameroons, sent to Mr. Rutherford. The cocoon appeared to be formed of dark brown earth, but attached thickly to the exterior were oval, slightly flattened, deep black, hard bodies (each nearly five lines long by two broad), which he thought were probably the excrement of some rodent quadruped.

Mr. Champion exhibited *Stenus Kiesenwetteri* (hitherto only found in this country at Wimbledon), *Gymnusa brevicollis*, *Bembidium nigricorne*, and *Plociomerus luridus*, all from Chobham; also *Philonthus cicatricosus* from Shoreham.

Mr. Howard Vaughan exhibited (on behalf of Mr. Bidwell) a specimen of *Notodonta trilophus*, taken about the year 1867 at Ipswich by a lamp-lighter. Mr. Douglas had captured some years ago at St. Osyth, in Essex, what was hitherto the only authentic British specimen of this insect.

The President read some interesting remarks from a letter he had received from Mr. B. G. Cole respecting some specimens of *Ephyra punctaria* which he had bred from eggs laid by the same female, the greater number of which emerged from the pupæ in July (as the spotted variety), while the remainder appeared in May, in all respects resembling the mother. He repeated the experiment in 1876 with similar results; all but one pupa from a batch of eggs laid in May appeared in July as the spotted form (males and females), the single exception remaining still in pupa, which it was presumed would appear during the coming May in the vernal dress. In this latter case he had reared a second brood of larvæ from eggs laid by some of the July females, all of which were now in the chrysalis state. Mr. Cole added—

"May not the above be considered a case of 'season-dimorphism' analogous to that occurring in *Pieris*, *Araschnia*, *Selenia*, &c., as investigated by Dr. Weismann, a slow process of development during the winter being necessary for the production of the May form (which may be considered the type), whilst if the development of the pupa is hastened by the heat (and light?) of summer, the smaller and less perfect individuals are the result. Referring to the similar case of *Selenia illustraria*, Dr. Knaggs (Entom. Mo. Mag., vol. iii. p. 238) remarks as follows:—'It is pretty well known that in the natural sequence *illustraria* reproduces itself in the form of *delunaria* and vice versa. But what I assert is, that whenever (whether at large, owing to exceptionally hot or long summer seasons, or in captivity from warmth, assisted perhaps by what Mr. Crewe has happily termed "feeding up quickly") the completion of the pupal stage is accelerated, then *delunaria* produces *delunaria*, not *illustraria*. Further, it is my belief

that the converse will be found to hold good, *viz.* that should the completion of the pupal stage be retarded either by cold seasons or climates in a state of nature, or artificially by aid of an ice-well, *illustraria*, not *delunaria*, would be found to result from *illustraria*.' And again (*loc. cit.* p. 256) he puts it thus:—'If *I.* = *illustraria*, *D.* = *delunaria*, and — = winter; then if there be but one brood in the year the sequence will be *I.* — *I.* — *I.*, and so on; if two broods, *I. D.* — *I. D.* — *I. D.*, and so on; if three broods, *I. D. D.* — *I. D. D.*, and so on.'

"I have not yet tried the effect of artificial retardation on the pupæ of *Ephyra*, but intend to do so when opportunity offers. My experiment shows that the effect of natural retardation over the winter months is to produce the type whatever may be the form of the parents; and that such natural retardation does usually (?) always occur in polygoneutic species I believe to be true from my experience in breeding various insects. Remembering that the summer broods of season-dimorphic species are smaller, and apparently vitally weaker than the spring ones, and that it is from the former that the latter are usually descended, may we not assume that the provision by which some few of the direct offspring of the spring forms are preserved through the winter in the pupal state, and so are enabled to pair with the offspring of the summer form, is of advantage to the species, in affording a 'cross' between individuals which have developed under very different conditions? A similar benefit may be derived in the commonly observed case of individual pupæ of single-brooded moths (*e.g.* *Eriogaster* and many *Notodontidae*) remaining two, three, or more years in that stage, and then eventually making their appearance at the proper season with the ordinary flight of the species.

"As bearing on the above suggestion, I may refer to what occurs in those single-brooded moths (*Sphinx Convolvuli*, *Acherontia Atropos*, &c.), which sometimes appear abnormally from the pupa before the winter hibernation, or which by 'forcing' have been artificially so developed. It has been stated, I believe, in most such cases in which an anatomical examination has been made, that the ovaries, &c., were found in an abortive or rudimentary condition. This goes to show that a long period of quiescence is necessary to perfect these delicate and highly specialized organs, and by a parity of reasoning it may perhaps be assumed that those pupæ which remain longest in that stage will (*ceteris paribus*) produce the most highly developed and vitalized imagos."

The President read "Notes upon a Strepsipterous Insect parasitic on an Exotic Species of Homoptera (*Epora subtilis*, Walk.) from Sarawak," accompanied by drawings illustrating the metamorphosis. He also read Notes on the Genus *Prosopistoma*, especially with regard to the species from Madagascar described by Latreille, of which he exhibited the types.

Mr. Cameron communicated a paper on East Indian *Tenthredinidae*; and Mr. Butler a paper on the Lepidoptera of the Amazon Valley, collected by Dr. Trail in the years 1873—75.

Mr. Baly communicated "Descriptions of new Species of *Halticidae*," and Mr. C. O. Waterhouse, "A Monograph of the Australian Species of the Coleopterous Family *Lycidae*."

Mr. Frederick Smith read "Descriptions of new Species of the Genera *Pseudomyrma* and *Tetraponera* belonging to the Family *Myrmicidae*.

May 2, 1877.—J. W. DUNNING, M.A., F.L.S., Vice-President, in the chair.

Messrs. H. J. Adams, Charleston Adams, and J. W. Slater were elected Members of the Society.

Mr. Jenner Weir exhibited a large silken cocoon from the Cape of Good Hope, supposed to be a spider's nest. On being opened it was found to contain, among other débris, a number of skins of small spiders and remains of the elytra of a beetle of the genus *Moluris*. Mr. Weir also exhibited a spider's nest from Montserrat.

Mr. F. Grut exhibited a large species of *Chelifer* from North Spain.

Sir Sidney Saunders exhibited a spider, *Atypus sulzeri*, taken on Hampstead Heath; it was found inhabiting tubes concealed under bushes in hedges. These tubes project about four inches above the ground and extend about ten inches beneath the surface. Mr. Jenner Weir remarked that he had observed the same or an allied species on the South Downs.

Mr. Champion exhibited a series of *Alaus Parlyssi* from Thaso Island.

Mr. C. O. Waterhouse exhibited specimens of *Dohrnia miranda* (Newm.), a Heteromerous beetle from Tasmania; also *Oreophilus erythrocephalus* and *Forficula erythrocephala* from the same region, these two last insects having some resemblance to each other. Mr. Bates suggested that the resemblance might possibly be accounted for by the two insects mimicking some other species.

Sir Sidney Saunders communicated a paper "On the Adult Larvæ of *Stylopidae* and their Puparia," and exhibited specimens in illustration.

Mr. H. W. Bates communicated a paper "On *Ceratorhina quadrimaculata* (Fab.), and Descriptions of Two new Allied Species." Specimens of the new species and also of *C. Morgani* (Westw.) were exhibited by the author.

Mr. Dunning urged upon authors of papers the advisability of exhibiting specimens of the new species described in their communications in all cases where possible.—R. MELDOLA, Hon. Sec.

THE ZOOLOGIST.

THIRD SERIES.

VOL. I.]

JULY, 1877.

[No. 7.

ORNITHOLOGICAL NOTES FROM THE LAKE DISTRICT AND WALNEY ISLAND.

By W. A. DURNFORD.

As a field for ornithological observation, I know no district of similar extent so entirely barren as the well-known Lake country. Residing within thirty miles of the heart of this district, it may be easily imagined that I should lose no opportunity of exploring its mountains and valleys, and thus pursuing the study of Natural History amidst some of the finest scenery our island can afford. The result is, however, most disappointing so far as animal life is concerned. During a three days' walking tour in the early part of June last, in the course of which I traversed a distance of about sixty miles, chiefly by unfrequented paths, the only birds which came under my notice, exclusive of those commoner species which seldom seem to wander far from human habitations, were a few pairs of Buzzards and Ravens, which I am glad to see still hold their own amidst the more inaccessible peaks in the neighbourhood of the higher mountains; a Merlin caught in a trap; a few Grouse, one of which I put up on Burnmoor—evidently the mother of a brood—succeeded, by feigning lameness, in leading a spaniel which accompanied me at least half a mile across the heather; a couple of Ring Ouzels; several Cuckoos; a Heron, which flew across Rydal Water, where floated a few Coots and Wild Ducks; a pair of Common Sandpipers sitting on the edge of Wastwater; a number of Curlews, which, to judge from their clamour, were breeding on the high ground above Ullswater; and some Gulls, chiefly Lesser Blackbacks, which are said to nest on some of the islands in Windermere.

This dearth of birds on the higher ground is, however, partly compensated for by the numerous species which may be seen at any time on the neighbouring coast extending from Morecambe Bay to Solway Firth. Notwithstanding the fact that the past winter has, in this neighbourhood at least, been one of the mildest on record, yet I am glad to be able to note that greater numbers of birds—mere especially those which come under the designation of sea-fowl—have visited our shores than have been observed for several seasons past in this locality. This fact must in the main be attributed to the prevalence of westerly and north-westerly gales, but I think it may be safely alleged that the protection afforded by the Sea Birds and Wild Fowl Preservation Acts has in some measure brought about this satisfactory state of things.

The Gullery on Walney Island was more thickly tenanted than ever during last summer—indeed the mortality arising from over-crowding was very considerable among the young birds. I observed that a larger number than usual of the Black-headed Gulls had taken up their abode towards the south end of the island, at a distance of four or five miles from the main body. Numbers of this species nest also on the Cumberland coast.

The local names of the birds which breed on Walney Island are perhaps worth noticing, and may be of use to future visitors to the locality. The Gulls are known as "Sea Maws"; Common and Arctic Terns are designated as "Sparlings," the same term being applied to a Sandwich Tern which was brought to me on May 5th, and which I was charitable enough to suppose had been picked up dead. Ring Plovers are called "Grundlings"; the name Peewit is pronounced "Penjt" or "Tenjt"; and Lesser Terns, or at least their eggs (for I can hardly think that such an unsuitable name can be applied to the bird itself), are termed "Sea Mice." "Shelducks" and "Sea-pies" speak for themselves; and the Stock Doves, which are tolerably plentiful, come under the general designation of "Pigeons." I may add, in reference to an editorial note in 'The Zoologist' for April, that Herons are here, as in Ireland, universally known as "Cranes."

Of the birds enumerated above as natives of Walney Island the most interesting is the Sheldrake, numerous pairs of which nest annually in the sand-hills both here and on the coast of Cumberland. This species disappears in the autumn, and resorts, I presume, to some more secluded spot, though where situated I have not been

able to discover. On the 13th January of this year I saw a flock of about a hundred on the channel, preparing no doubt to spread themselves along the coast, where they may now be seen in pairs—a small remnant of the thousands which, within the memory of man used to frequent the warrens in this locality. Considerable numbers are unfortunately killed during the spring, and fetch a large price for ornamental purposes. Having always been under the impression that the young of these birds take to the water for refuge at the least alarm, I was somewhat surprised at what I witnessed on the 4th August, whilst out with my gun on one of the Cumberland estuaries. I had been watching, with a telescope, a brood of nine young Sheldrakes, which, together with their parents, were basking in the sun on the mud bordering the river,—at that time three or four hundred yards in breadth,—when, having inadvertently shown my head, the whole brood rushed helter-skelter into the water, swam rapidly across the stream, and, climbing out on the opposite bank, made off across the marsh towards a hedge which bounded the adjacent cornfields. About an hour later I came suddenly upon another brood in a much narrower part of the river, and they at once proceeded to dive with the speed of lightning, popping up and down again with such rapidity that I doubt whether I could have killed any had I felt so inclined. As in the former case, as soon as these had reached what they seemed to consider a safe distance, they also left the water and disappeared on the marsh the other side. On going round by the nearest bridge I could find no trace of the young birds, though the old ones were flying round at a safe distance. I ought to mention that at low tide the river was reduced to three or four feet in depth and about thirty yards in breadth, which would be sufficient to account for these unusual proceedings on the part of the young Sheldrakes, though the old birds might have provided more effectively for their safety by leading them down to the sea, about half a mile distant. A male bird which I killed later on the same day presented a very shabby appearance—a marked contrast, especially as regards the scarlet knob at the base of the beak and the brilliancy of its plumage, to a magnificent specimen which was obtained in March by the keeper of the Walney Lighthouse.

The first of what may be called the migratory ducks—those, namely, which do not, as a rule, nest in England—appeared on our large warm water reservoir (situated about a quarter of a mile

from the sea, and in close proximity to the town of Barrow) on October 14th; and on the same day I obtained two Knots in winter plumage on the sea-shore. For about three weeks from this date ducks were tolerably plentiful on the reservoir and neighbouring ponds, and twelve or thirteen specimens, including Wigeon, Scoters, Goldeneye and Scaup Ducks were, to my knowledge, bagged during this period, independently of those killed on the coast. These birds were doubtless stragglers from flocks migrating southwards, and I could hear of no more being obtained till December 30th, when I killed a pair of Goldeneyes and a male Scaup on the same reservoir. At the same time a friend wounded another Scaup, which, being unable to fly, remains still (April) with us, fraternizing with some tame ducks, but always roosting on an island by itself. It remains to be seen whether it will interbreed with its domestic companions.

Very few birds came under my immediate notice during the northward migration in the spring of this year. On March 1st I observed a large flock of Golden Plover, some of which were in summer plumage, on a fallow field in the neighbourhood; and on the 4th a number of wild geese, twenty-seven in all, were seen wending their way towards the East, evidently ignorant of the fact that by the operation of a recent Act of Parliament, which protects these migrants during the breeding season, they might have descended from their elevated position without much fear of molestation.

The rough cold weather that prevailed at the end of 1876 and the commencement of the present year brought in a number of sea birds which are not, as a rule, to be found in our channel. On December 28th a fine specimen of the Great Northern Diver, together with two immature Redthroats, were seen, and I regret to add killed close to the town, and on the 31st twelve wild geese appeared on Walney Island, though, as it chanced to be Sunday, they were allowed to pass on their way unharmed. On the 1st January the harbour was full of Ducks of various species, Gulls, Divers, Razorbills, and Gannets, though, owing to the prevalence of a strong easterly gale but few specimens were obtained. A fine Gannet, an old male, measuring six feet across the wings, was, however, procured by a friend, together with a male Scoter, large flocks of which have frequented Morecambe Bay throughout the winter. In the gizzard of the last-mentioned bird I found several

whole cockles of considerable size, and numerous fragments of this and other mollusks. About this time a Red-breasted Merganser in immature plumage, was killed on the estuary of the Duddon, and brought to a local birdstuffer for preservation.

At the beginning of February, happening to be on Walney Island, I took the opportunity of calling upon the owner of a pair of Pallas's Sand Grouse, which were killed at the time of the notable irruption of this species in 1863. I was glad to find the specimens in good condition, though sadly spoiled in the stuffing. The history of their capture is interesting. The man who first saw them (the father of the present owner) came upon the flock of, I think, eight while out with his gun on the island, but had no ammunition with him beyond the two charges in his piece. He succeeded, however, in bringing down two, and at once ran home for more powder. On his return the rest of the birds were gone, and were not heard of again nearer than Lincolnshire, where some were killed on the following day.

The Walney farmers have been crying out this winter against the wholesale destruction of Short-eared Owls, which have visited the island in greater numbers than usual, and might be seen at any time of day hawking after the mice, which here abound, owing I presume to the absence of their natural enemies. The first flight appeared, with the Woodcocks, on October 28th, and throughout the following month numbers were killed almost daily. I doubt, in fact, whether one in a dozen lived to depart again in the spring. Long-eared Owls may also be seen every winter in Sowerby Wood, an extensive coppice to the north of Barrow-in-Furness. This wood is noted for its Woodcocks, and I may mention, as a fact which I have not hitherto seen noticed, except by a single writer in 'The Field,' that those which breed there annually depart with their young, about July; at least, I gather from those who are most likely to know that although old birds are tolerably plentiful, and young ones have been found in June, none are ever seen in August and September.

On the whole, what are known as rare birds have been extremely scarce during the past twelve months, the only one which has actually come under my observation being a specimen of Tengmalm's Owl, which was killed by a gamekeeper at Irton, in Cumberland, in October last.

ORNITHOLOGICAL NOTES FROM DEVON AND CORNWALL.

BY JOHN GATCOMBE.

THE following interesting varieties have lately come under my notice:—A Common Snipe, the plumage of which exhibited the usual markings of the species, but were exceedingly faint and on a buff ground: I once obtained a very similar specimen in Leadenhall Market, and have heard of others. A Blackbird having a large round pure white spot on either cheek, the rest of the plumage being of a fine black, similar to that of an ordinary old male; bill, rich yellow. Mr. Clogg, of Looe, kindly sent me a rather pretty variety of the Chaffinch, with a pure white line running through its eyes and round the back of the head, giving it a singular appearance: the plumage, otherwise, was of the usual tint. I may here add that the white Pipit mentioned in my last notes as being in the possession of Mr. Marshall, of Taunton, proved to be *Anthus Richardi*.

A short time since, when visiting a creek by the side of the St. Germain's River, I witnessed a somewhat unusual and interesting sight. A flight of about thirty Redshanks were making towards a sheltered bay; but before reaching the land, to my great surprise, they all suddenly alighted on the water, much out of their depth, and quietly swam towards the shore, in a rather compact body, until their feet touched the bottom, when they waded in and commenced feeding in their usual manner. The water at the time being quite unruffled, glassy, and very clear, they were doubtless deceived as to its depth, but did not appear in the least astonished at being obliged to swim. The sight was really a pretty and interesting one, and, but for their long orange-coloured bills, they might easily have been mistaken for a flock of Teal. Mr. Thompson, in his 'Birds of Ireland,' states that Redshanks often alight on the sea where it is deep; but, to the surprise of a shooter in Belfast Bay, on November 20th, 1847, three of these birds appeared swimming about and busily feeding on the surface of water about eight feet in depth, and, from their turning quickly about in all directions, he at first imagined they were Gray Phalaropes.

On March 6th I heard Herring Gulls crying in the air, as they do during the nesting season, and many Pied Wagtails had nearly assumed their perfect summer dress. Curlews were numerous on

our rivers, but some had already taken themselves off to the moors. A few Black-headed Gulls had left for their nesting quarters. On the 10th many Kittiwakes were brought to a local birdstuffer, but I found among them only one that had assumed the nuptial attire. Razorbills and Guillemots were at the same time obtained in full summer dress. A Gannet and Manx Shearwater were also shot, and I was informed that hundreds of the latter species might have been seen in the channel off Plymouth. On the 13th I met with many more flocks of Redshanks, and I understand that within the last few years immense flocks have remained on our rivers during the winter. The Lesser Black-backed Gulls had completely taken the place of the Great Black-backed, and were to be seen daily flying in pairs on all parts of the coast and in our harbours, sometimes resting on the mud-banks in large flocks. I am sorry to add that, up to April 1st, numbers were wantonly killed. It is a great pity that gulls and other sea birds should be destroyed so shortly before their breeding time.

I noticed Black Redstarts in two localities near Plymouth until March 17th, but soon after that date they had nearly all left the coast. Titlarks were daily to be seen mounting in the air, as in the nesting season, and Mews (*Larus canus*) were plentiful in our harbours, as they generally are just before leaving for their breeding places.

Mr. Clegg sends me word that he saw a flock of Whimbrels on March 21st, also some Turnstones and a Chiffchaff. I never met with the Whimbrel so early myself, indeed not before the end of April; but Mr. Stevenson, in his 'Birds of Norfolk,' says that it may be occasionally seen in March and April, though of course the main body comes in May. Possibly the birds seen by Mr. Clegg might have wintered in the locality.

I remarked the first pair of Wheatears for the season in the vicinity of Plymouth, on March 26th; and on the 28th many more Redshanks on the mud-banks of the St. Germain's River, hence, as they remain with us during the winter, and I believe until late in spring, I am beginning to hope that, if unmolested, some may at length be induced to nest in the neighbourhood.

On April 10th I observed a Blackcap and Tree Pipit in the neighbourhood of Plymouth, and found Chiffchaffs very plentiful. There were still a few Redshanks on the mud-banks of the St. Germain's River. On the 14th I visited the cliffs of Wembury, at

the entrance of the River Yealm, where some two or three hundred Herring Gulls were assembled at their annual breeding place, but I could not distinguish any nests, although from the actions of the birds I feel sure there must have been many. A solitary adult Blackheaded Gull was observed off the Plymouth Hoe during a severe gale on the 17th, long after the rest had left for their breeding stations. On the 25th I walked to Whitsand Bay, on the Cornish coast, where I observed a Common Sandpiper—the first I had seen this year—and five Scoters. Several Swallows came in direct from the sea, and many were afterwards observed along the coast: weather bright, but the wind blowing hard from the south-east.

Again visited the gulls at Wembury on April 28th, and then observed several nests, some of which contained eggs. A pair of Peregrines had a nest in the same locality, and the male kept flying swiftly round, making a great noise. I was sorry to see a number of boys searching for nests amongst the cliffs: they had collected upwards of forty eggs of the Jackdaw and one of the Herring Gull. The Peregrines are also occasionally robbed of their eggs and young. Some years ago a shipwright's lad took three young ones from a nest at Wembury, one of which I purchased and kept alive for a long time; and afterwards, hearing that he had still another left, I thought I would endeavour to get that also. On calling at the yard in which the young man worked, he told me that he lived on the other side of the water, but that if I would not mind waiting until six o'clock, the time he left work, he would row me across to see the bird. On my asking whether he kept it confined in a cage or in a garden, he replied that it was quite free and flew about wherever it liked, but would come to his call or whistle from any distance within sight or hearing. On landing and walking into the village, my companion began to call and whistle, when suddenly, to my astonishment, I saw the falcon swoop down from the corner of a high building at the end of a street, and alight on his shoulder. I did not purchase it because I found that it had injured and disfigured its bill, the tip of which was completely broken off, from a habit it had of striking at and trying to tear stones thrown to it by the boys of the village. I have often since regretted that I did not buy this docile bird, for possibly the bill might have become right in time.

On the rocks at Wembury I remarked a Cormorant in rather peculiar plumage. The whole of the lower parts, from the chin

downwards, were almost white, and the back and wings apparently of a silvery gray, but I was not near enough to see whether the edges of the feathers were darker. It had the appearance of a young bird of the last year, the plumage of which had been bleached by the weather. Mr. Clogg mentions having seen a similar bird on the Cornish coast a month or two since.

Lesser Blackbacked Gulls were still about on April 28th, but most of the old breeding birds had left. On the 30th there were three young Ravens, almost as large as their parents, out of the nest at Bovisand, flying and hopping about on the summit of the cliff. To my knowledge, Ravens have nested in the same place for forty years. A Kestrel had its nest close to the Ravens, and others were found breeding all along the coast. Returning from Bovisand across the Sound, I heard and saw two Whimbrel, and remarked a pair of Razorbills in full summer plumage.

Whimbrels were numerous on the mud-banks of the River Lynher on May 2nd, and Whitethroats were plentiful in the hedgerows along the coast. A Swift was flying over Stonehouse on the 4th, and the first House Martins made their appearance in the neighbourhood on the same day; wind east, blowing very strong and cold. By the 7th the weather had become mild and warm, more Swifts were seen, and I observed Jackdaws circling in the air after insects, in the manner of Swallows and Starlings during still and warm weather—a habit I had not before noticed in these birds. I was also pleased to see several pairs of Water Ouzels on different parts of the River Erme: they doubtless had nests in the vicinity.

A few days after I visited a small heronry, consisting of six or seven nests, which has been formed within the last three or four years on some oak trees in Cheviock Wood, on the Cornish side of the Lynher, near St. Germains. It is most probably an offshoot from the old-established colony at Warleigh, by the side of the Tavy, a Devonshire stream, some miles distant, and although small is I think entitled to be added to the list of British heronries. The old birds left the trees and their nests long before I got near them, but on searching among the brushwood beneath I found a dead young one, in the down, which had evidently been blown out of the nest during a very heavy gale from the N.E. a short time

previously. This young bird, being almost black from decomposition, had much the appearance of a young Cormorant, but the "grizzly" crest peculiar to nestling Herons was very conspicuous. Its legs seemed somewhat thick and swollen or puffed up, especially about the knees. On coming down the river, towards high water, I remarked large flocks of Curlews resting in the fields awaiting the ebb, and numbers of Dunlins with fine black breasts along the shore, some of which, remaining on low rocks until the flowing tide had completely covered their legs, appeared as if actually floating on its surface.

About the middle of May several Sanderlings, in partial breeding plumage, one Lesser and two Greater Spotted Woodpeckers, which had been obtained in the neighbourhood, were sent for preservation to a Plymouth birdstuffer. Whimbrels and other waders about the same time were constantly passing over the town at night, making a great noise.

Many more Herring Gulls were sitting at Wembury on May 17th, and I remarked a large female Peregrine flying round the cliffs. Two fine adult Cormorants examined by me about this time had already lost almost all traces of the early spring plumage, which is usually the case at this time of the year, the head, neck, and whole under parts being of a fine blue-black, without a sign of the slender white filamentous plumelets on the neck or oval spot above the thigh; the white patch under the chin and crest on the nape still remained, but it seems strange that the so-called summer plumage should so soon begin to disappear.

Again visited Wembury on May 23rd, and found many more eggs in the nests, but as yet no young. However, I am sorry to add that these nests, where at all accessible, are almost daily robbed by boys. Whilst looking down with my glass upon a small projecting ledge at the extreme edge of a fearful precipice on which was a gull's nest containing a single egg, to my great surprise and horror, a lad crept suddenly round on his hands and knees, and after securing the egg, not having room to stand or turn, was actually obliged to sit bolt upright in the nest, with his back against the cliff and his legs dangling over a perpendicular precipice one hundred feet above the sea! Catching sight of me, as I supposed, he at once became motionless, but apparently quite composed, with his arms crossed on his breast and his face turned upwards, as if intently watching the sky, and so he remained until

I was on the eve of calling out; but thinking that, should he not have observed me, my voice might startle him, and being, moreover, unable to render any assistance, I quietly walked back out of sight, anxiously awaiting his return to the summit, which, to my great satisfaction, ultimately took place. Upon asking him why he so recklessly risked his life, he replied that his passion for birds-nesting was so strong he really could not resist, notwithstanding he had already broken his arm three times, besides meeting with various other accidents. The place on which he sat was, he owned, most dangerous, and that when getting round to the ledge, had a tuft or even a few blades of grass given way, he certainly must have lost his life; but he was used to climbing and feared no danger. His reason for remaining motionless on the nest was that, mistaking me for one of the coast-guard, or perhaps a keeper, he kept still, hoping that I might not remark him, and was obliged to fix his eyes upwards, not daring to look down. I fully intended to give him a good "jobation" for taking eggs at all, but after the great pluck displayed could not find it in my heart to say much. However, he promised not to come again or touch a young gull at any place. The rents in his clothes were indeed a sight to behold.

The same afternoon I was grieved to hear that the Peregrine Falcon, to which I have before referred, had been killed by a farmer of the neighbourhood, from whom she had at various times carried away no less than twelve young turkeys, no end of chickens, and a pair of Ring Doves that were breeding near his house. I afterwards examined this same bird at a birdstuffer's, and found the remains of a chick in her stomach. The male (a very small one), I am glad to say, still remains in the locality of the gulls, and is constantly chased by those indignant birds; but I fear we shall have no brood of young falcons at Wembury this year.

On May 31st a nice Long-eared Owl was brought to a bird-stuffer at Stonehouse. This species is very uncommon in the neighbourhood of Plymouth.

THE BIRDS OF THE MOY ESTUARY
AND THE SURROUNDING DISTRICT.*

BY ROBERT WARREN.

Order RASORES.

Wood Pigeon, *Columba palumbus*.—Very numerous, and increasing in numbers every year, causing great annoyance to farmers by eating the young turnip plants when they have assumed the rough leaf, just after escaping the ravages of the fly. In winter also, during frosty and snowy weather, they eat off the top leaves and expose the turnips to the full effects of the frost. In our fruit garden they are equally destructive, eating the entire crop of yellow gooseberries, none of which can be saved unless the bushes are netted. Last season, when the yellow ones were protected by nets, the Pigeons attacked the red gooseberries, and did a great amount of damage.

Rock Pigeon, *Columba liria*.—Very common round the bold rocky coasts, breeding in caves and holes.

Turtle Dove, *Columba turtur*.—Has only twice come under my notice here, namely, on August 27th and October 6th, 1862, upon each of which days I observed a solitary bird feeding in a stubble-field, and, as I saw no appearance of any crescent on the neck, I concluded they were young birds reared in the neighbourhood, probably among the young larch and fir plantations at Belleek.

Pheasant, *Phasianus colchicus*.—Has been introduced into this district by several gentlemen, and appears to thrive very well.

Partridge, *Perdix cinerea*.—Common, and of late years increasing in numbers.

Quail, *Coturnix vulgaris*.—Although resident, not common, and by no means so plentiful here as in the South of Ireland.

Red Grouse, *Tetrao scoticus*.—Common throughout the mountains and on extensive heathy tracts.

Order GRALLATORES.

Golden Plover, *Charadrius pluvialis*.—Resident and common, but thousands of migratory birds are added to the number of the home-bred birds every autumn, and throughout the winter large

* Continued from p. 242.

"stands" rest by day on the sandy flats of the Estuary near Bartragh, and are most numerous when the moon is full.

Ringed Plover, *Charadrius hiaticula*.—Very common in winter. A few pairs breed on Bartragh, where I have found the nests a short distance above high-water mark: they were merely slight hollows scratched in the sand, and every nest that I saw was lined with little bits of broken cockle-shells. I have met with a few pairs in summer on the shores of that fine fresh-water lake, Lough Conn, and have no doubt that they breed wherever there are sandy bays on the margin of the lake.

Gray Plover, *Squatarola cinerea*.—Met with in very limited numbers on the sands and shores during the winter, generally not more than one or two birds being seen together; but towards the latter end of March and beginning of April they commence to collect together preparatory to leaving for their summer haunts. On the 29th March last I saw a flock of nearly thirty birds on the sands near Bartragh, and shortly afterwards saw a flock of eighteen flying past. They frequently remain as late as June before leaving for their breeding quarters. Near Bartragh, on the 29th June, 1860, I saw a flock of thirteen Gray Plovers, two of which showed the black breast peculiar to the summer plumage, and on April 23rd, 1875, near the same place, I saw a flock of nine, two of which had black breasts.

Lapwing, *Vanellus cristatus*.—Very common, and breeds on all the low swampy lands throughout the country, but in autumn their numbers are increased by thousands of new arrivals from the north, at least I see no other way of accounting for the multitudes that are to be seen everywhere, especially on the sands, which is the more strange as they seldom feed by day unless when the nights are dark. They frequent the sands in large numbers up to December, and by the middle of that month the flocks are much reduced in numbers, and become more so as the season advances, probably by many of the birds going farther south. In February and March there is a partial return of the flocks to the coast, but not in such numbers as appear in September and October.

Turnstone, *Strepsilas interpres*.—A regular visitant, appearing generally in August and September, and remaining occasionally as late as May and June.

Sanderling, *Calidris arenaria*.—Common during autumn and spring on the shores the bay and estuary. Sometimes to be seen

in May, and frequently in August, when many still retain some of their summer plumage.

Oystercatcher, *Hæmatopus ostralegus*.—Common, and may be seen sometimes in flocks of a hundred birds. I have not yet discovered any breeding haunt in the district.

Heron, *Ardea cinerea*.—There are several heronries in the district, so that the species is not uncommon.

Curlew, *Numenius arquata*.—Frequents the bay and estuary in immense numbers, and even in summer a good many may be seen about the shores, although, so far as I am aware, none breed within the district.

Whimbrel, *Numenius phœopus*.—A spring and autumn migrant, appearing in May, and again in August, but in autumn it is not seen in such numbers as in spring.

Redshank, *Totanus calidris*.—A very common species, and early in July a few, on their return from the breeding grounds, may be seen assembling on the shores of the little islands near Roserk Abbey (probably birds bred in the district). About the end of the month hundreds of both young and old assemble at the same place, and some of the young have the feathers of the wings not quite pointed, showing that their nesting-place could not be far away, since no birds with the wings not fully grown could take a long flight. Their early gathering also seems to indicate the nearness of their breeding haunts. These large flocks remain about Roserk for about a month or six weeks, after which they separate into smaller flocks, and by the end of October their numbers have diminished down to the usual winter stock of Redshanks frequenting the shores.

Spotted Redshank, *Totanus fuscus*.—I first met with this rare bird in the great frost of January, 1867: it was feeding in a little muddy bay between Moyview and Killanley, and, as I was returning from snipe shooting, I wished to discharge my gun, as a preparation for washing, and seeing a Redshank feeding a long way off I took a chance shot at it, and fortunately knocked it over. My dog fetched it, but as it was nearly dark at the time I only remarked that its bill and legs were very long and slender, and thinking it merely a variety of the Redshank I put it into my bag, unconscious of having secured such a prize—the second example of the species known to have been obtained in Ireland. My next meeting with the Spotted Redshank was in January, 1869, when one day my

attention was attracted by the very peculiar cry of a sandpiper flying at a great height over Roserk, and as I never before heard a similar call I was much puzzled to find out what bird it was. Again, on the 13th September of the same year, I started a sandpiper off the Moyview shore, which uttered the same peculiar call-note, and surprised me by its wild and powerful flight. It rose from the shore like a wild snipe, soaring to a great height and going right off out of sight, so unlike the habit of other sandpipers. I next heard the call near the island of Baunros on November 15th, 1871, and again on November 27th, 1874; and I both saw and heard the bird on the 23rd April, 1875, when passing Baunros in my punt, but it was so wild that I was unable to get a shot at it. Although I went on two occasions to the island I was always unsuccessful, and after the 25th the bird disappeared altogether for the season. My next meeting with it was on September 4th, 1876, when I heard it call as it flew along the shore here, and afterwards saw and heard it on several occasions, but although most anxious to obtain it, I was always unsuccessful, owing to its great wariness. On the 30th October I was in my punt near Roserk, when I got a close view of the bird resting on the strand amongst a flock of Redshanks. As the punt drifted near, the latter made off, but the stranger ran along the shore before the boat, calling loudly. I was well able to see its long slender bill and legs (so very different from those of the common bird), and the streak between the eyes and bill, and when it flew off the dark wings also proved that it was the Spotted Redshank. After leaving the shore, it flew a couple of hundred yards away to another island, and as it was alone I easily got a shot from the punt and knocked it over—the third Spotted Redshank known to have been obtained in Ireland. My curiosity as to what bird uttered the peculiar calls that had so long puzzled me was thus satisfactorily gratified.

Green Sandpiper, *Totanus ochropus*.—A very rare visitant, and only twice obtained here. The first I shot at a little lough on the 13th January, 1866, and the second was shot at the same place on August 25th, 1874, by Mr. A. G. More, who saw a pair there.

Common Sandpiper, *Totanus hypoleucus*.—A regular summer visitant to all the lakes and rivers.

Greenshank, *Totanus glottis*.—Common. It very probably breeds on the shores of some of the little bay lakes, as I have met the

young birds on the shores here as early as July 6th, but the main flocks do not appear before the end of that month.

Avocet, *Recurvirostra avocetta*.—Has only once come under my notice. On October 28th, 1875, I was returning from Bartragh in my punt, with the gun unloaded, when just before reaching the landing-place I noticed a pair of birds feeding with some Greenshanks in the shallow water on the sand-bank. They looked so very white in the evening light that at first I took them to be albino Greenshanks; however, as the boat approached, the Greenshanks went off, leaving the other birds still feeding, and when I got closer to them I saw they were Avocets. Being very tame they allowed me to bring the boat within eight or ten yards of them, from which distance I watched them feeding for a long time—in fact, until the evening light began to fail. Next day I saw them resting on the shore, but being unable to get a shot, I asked my friend Captain Dover to look out for them when out with his punt-gun. A few days afterwards he obtained both birds at a shot, one of which he kindly gave to me, and the other he presented to the Royal Dublin Society's Museum.

Black-tailed Godwit, *Limosa melanura*.—Rare on this part of the coast. A bird in full summer plumage was shot on the tidal part of the river near Belleek by Mr. Howley some time in May, 1863. A solitary bird has occasionally come under my notice in winter, but until last winter I never obtained a specimen. On the 6th November last I got a very fine bird in winter plumage, and at the same shot bagged thirteen Lapwings, thirteen Redshanks, and a Bartailed Godwit.

Bartailed Godwit, *Limosa ru/a*.—Common in the bay and estuary during winter, but seen in greatest numbers in spring and early summer. These birds begin to assemble in large flocks about the beginning of March, increasing in numbers all through that and the following month,—probably coming from more southern haunts,—and although some leave during April, yet large flocks remain about the estuary all through May and even up to the middle of June, and strange to say, all, with few exceptions, exhibiting no trace of the red summer plumage. I saw a flock of over one hundred birds near Bartragh on June 11th, 1872, and another large flock on the 14th of that month. In 1873 I saw large flocks on June 17th, all in the pale plumage, and on three occasions only have I seen any in the red plumage. On the 10th

June, 1852, I noticed two red-breasted birds amongst a flock of fifty pale-coloured ones. On June 2nd, 1866, amongst a flock of Knots and light-coloured Godwits, I observed another pair of the latter with red breasts; and some time in May, 1876, I saw one red-breasted bird amongst a very large flock of pale-coloured ones. It appears to me very doubtful whether the birds seen in the paler coloured plumage so late in the season would assume the red breasts at all that summer.

Curlew Sandpiper, *Tringa subarquata*.—Occasionally seen on the sands between Bartragh and Killala in September and October, but I have not met with it later in the season. This species probably moves farther south after the latter date. When associating with Dunlins it may be easily distinguished by its peculiar note and white rump.

Dunlin, *Tringa alpina*.—Although common, is not seen in such large numbers as in Cork Harbour or other estuaries having extensive mud-banks instead of sandy flats, the soft mud affording richer feeding grounds. I have observed Dunlins on the moory shores of Lough Conn in June, where I am certain numbers have nests every season. Of those seen, all exhibited the black breast peculiar to the summer plumage, and from their manner of flight indicated the fact of nests being somewhere near.

Purple Sandpiper, *Tringa maritima*.—A regular winter visitant, sometimes remaining till early summer. I have seen them on the rocks of Kilcummin Head as late as May 24th; and many years ago I remember meeting with a flock on the coast between Cork Harbour and Robert's Cove on May 17th.

Knot, *Tringa canutus*.—Abundant on the sandy flats of the estuary between Bartragh and Killala. I once heard the calls of a flock passing overhead on August 25th, and I have seen a flock on the sands here on June 2nd.

Woodcock, *Scolopax rusticola*.—Common in winter. During the severe frost of January, 1867, when snow covered the ground for twelve days, and most of the springs were frozen, numbers of Woodcocks were driven down to the coast. They used to lie along the shore amongst the sea-weed when the tide was out, and great numbers were killed on the coast between Eastkey and Enniscroon by the country people, who stalked them from behind rocks and large stones, and when they rose knocked them down with sticks. Some of the people became so expert at this mode

of killing Woodcocks, that they used to secure several couples in a day.

Snipe, *Scolopax gallinago*.—Common, and breeds throughout the district. Sometimes during sharp frosts they suffer severely and die off in great numbers. During the severe winter of 1854-55 they were nearly all exterminated in this way, and it took a couple of years to recruit even a moiety of their usual number. Again in 1867 a great number were destroyed by the cold and want of food.

Jack Snipe, *Scolopax gallinula*.—Common in winter. During snow it occasionally collects in numbers at some favourite spring or sheltered stream.

Land Rail, *Crex pratensis*.—A common summer visitant.

Water Rail, *Rallus aquaticus*.—Resident, though seldom seen, unless driven by frost from its concealment in the caves along the banks of the streams it frequents.

Waterhen, *Gallinula chloropus*.—Very common.

Coot, *Fulica atra*.—Common and resident.

(To be continued.)

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OCCASIONAL NOTES.

THE NATURAL HISTORY OF DONEGAL.—I am indebted to a friend for a copy of 'The Zoologist' for May, in which I see that some of your correspondents are much exercised in spirit over a paper of mine. It could only be a short abstract of my paper you printed, for the whole communication would altogether occupy about a dozen pages of your monthly issue. Not being able at the time to refer to authorities on British Mammals, I gave the local names for the animals. I saw the Squirrel, *Sciurus vulgaris*, twice in Drumonaghan Wood in 1875. Whether it was introduced into this county, as in the case of County Longford, I do not know, but if I can find out anything to that effect I will communicate it to you. We have the Stoat, *Mustela erminea*, but we have also a smaller member of the same genus, lighter in colour, and with no black tuft at the end of the tail. I expect to be able to send you a specimen of the latter very soon, that you may determine the species. Our "ferret" is the Pine Marten, *Martes abietum*. This animal has been seen and followed up with dogs at the Rouken and the Cairn, near to this village, but taking refuge in trees was not captured. Mr. Stewart says they take possession of the old nests of Magpies. He informs me that he saw a pair of Badgers in the Gap of

Barnes, a rocky pass ten miles from this, and one at Lough Talt. The Pipistrelle, *Vespertilio pipistrellus*, is the only Bat I have seen hereabouts. I have seen one flit about church on Sunday, and it proved more successful in securing the attention of the people than the eloquent divine in the pulpit. With regard to birds, *Ardea cinerea* is always spoken of as the "Crane." Both *Anser torquatus* and *A. leucopsis* are known as Bernicle Geese, although the name belongs properly to the latter. As far as my observation goes, both species occur in about equal numbers on Lough Swilly. The owl mentioned as the Tawny Owl agreed best with the description of that species as given in such books as I had at hand. It was not the Long-eared Owl. The Thrush, singing in the gloaming and on "till night's dark mantle has covered all," has probably earned for it here the honourable title of the "Irish Nightingale." I myself saw fully-developed specimens of *Echinus sphaera* frequently on the fronds of *Laminaria digitata* while looking over a boat's side in calm water. I have no information as to "the difficulty" they may have experienced in "prowling over the fronds," but there they were. I presume I am not to be held responsible for the typographical errors in the spelling of *Chylocladiæ* and *Echinus*.—JAMES A. MAHONEY (Ramilton).

[We alone are to blame for the typographical errors referred to, and which escaped us when revising the proof of the article in question. We shall be very glad to receive a specimen of the "smaller member of the Stoat genus," which from the description we cannot doubt will prove to be a Weasel. Notwithstanding the generally accepted opinion of Thompson that the Weasel is not found in Ireland (see p. 224), we have evidence to the contrary in the following note from a very accurate observer.—ED.]

OCCURRENCE OF THE WEASEL IN IRELAND.—Observing by your editorial note, at p. 224, that there is some doubt whether the Weasel is found in Ireland, I write to say that on the 5th November last, when visiting a friend in the County of Mayo, I saw a Weasel one afternoon hunting about a stone wall at Currawn, near Achill Sound, and as I watched it for some time at the distance of only a few yards, I could not possibly have been mistaken as to the species. I know both the Stoat and Weasel too well to mistake the one for the other, and had I been aware at the time of the existence of any doubt on the subject, I could easily have shot and forwarded the specimen.—WILLIAM BORRER (Cowfold, Horsham).

MARTEN-CAT IN ENGLAND AND WALES.—It is perhaps worth noticing that the Marten-cat is still plentiful in the wilder parts of Cumberland and the immediately adjoining portions of Lancashire and Westmoreland. Owing to the destruction wrought by the Marten-cat amongst the lambs, all available means are employed to exterminate the race, and, in addition to traps and guns, many of the farmers in the Lake District employ fox-hounds, with which these animals as well as foxes are hunted at all seasons of the

year. In this way I should estimate that from twelve to twenty "Marts" are killed annually in this neighbourhood; but, owing to the inaccessible spots in which their strongholds are situated, there does not seem to be much fear of their being exterminated just at present. The species is also common in North Wales.—W. ARTHUR DUNFORD (Barrow-in-Furness).

MARTEN-CAT IN SCOTLAND.—With regard to the distribution of the Marten-cat in Great Britain, I cannot say anything as to its haunts in England, but from what I have seen and heard in Scotland I believe it to be more numerous than is generally supposed. From my own experience I know that, were I to live much in certain parts of the Highlands, I should soon cease to regard either the Marten-cat or Wild Cat as a prize. The latter is, of course, much more numerous than the former, and an occasional visit to the shop of Mr. McLeay, of Inverness (the well-known animal preserver), will soon convince one that it is positively common. Referring to the notes of my last trip to Inverness-shire and Ross-shire in 1871, I saw at the house of the keeper at Eilean-reach, near Glenelg, the skins of two Wild Cats and one Marten-cat, in addition to other "vermin." They had, of course, been killed upon the "shootings" of Eilean-reach. At Loch Hourn-head, not far from the above, I saw at the house of the head keeper, Angus Gillies, three Marten-cats' skins, also killed on his ground. During my stay at Shiel House, at the head of Loch Duich, I was assured that a former keeper (McDonald), whom I know, had trapped several Marten-cats in a wooded gully close to the Inn at Shiel House. The date of these captures I do not know: it must be many years ago. All the localities I have named are close to each other, and I believe that if wanted and looked after, many Marten-cats would still be found in that part of Inverness-shire which I visited in 1871. It is true we seldom see the Marten-cat in the shops of our bird and animal preservers in Scotland (Mr. McLeay's perhaps excepted). The reason is that when trapped it is soon skinned for the value of the skin, and never seen, possibly, by any one who would think it worth while to record its capture.—EDWARD HARGITT (10, Alexander Square, Brompton, S.W.).

MARTEN-CAT IN SCOTLAND AND IRELAND.—When in Sutherland, in May, 1876, one of the keepers in Reay Forest told me he had, I think, fifteen Marten skins awaiting the visit of the furrier's traveller. Lord Kenmare's keeper at Killarney, last April, spoke of trapping them in that district as no uncommon thing, and mentioned 7s. 6d. as the usual price he got for his skins; in Sutherland I was told either 15s. or 20s. was the figure. In neither place did I see animals or skins. Wild Cats and Otters are frequently trapped in Reay.—H. M. WALLIS (Reading).

BLACK VARIETY OF THE BROWN RAT.—An adult female and two young of this variety of the Brown Rat, *Mus decumanus*, were taken early in May near Rottingdean, in this county. The fur is softer and the colour of a bluer black than that of the true Black Rat, *Mus rattus*; and it is also

readily distinguished from that animal by the shortness and roundness of the ears and comparative shortness of the tail. I do not know that it has been previously observed, but I see that, in swimming, *Mus decumanus* uses its tail, not in the manner of a man sculling a boat from the stern, but with a horizontal snake-like motion.—WM. BORRER (Cowfold, Horsham).

PURPLE GALLINULE IN SOMERSETSHIRE.—The Somersetshire Purple Gallinule seems to raise rather an interesting question—namely, what amount of evidence should be required to admit a bird confessedly killed in an apparently wild state within the British Islands to a place in our list of birds as a *bonâ fide* wanderer. I quite agree to one of the remarks made by Mr. Mathew in the June number of 'The Zoologist' (p. 252), that "it is well nigh impossible to lay down any hard and fast rule;" each case must be decided on its own merits. But Mr. Mathew immediately after seems to suggest, in spite of the difficulty of doing so, that we should draw a hard and fast line at "a Parrakeet, a Whidah Bird, or a Canary in its yellow plumage." If this is to be done, and we are to admit everything else merely on evidence of its having been found in an apparently wild state, and with no signs of having been in confinement about it, we should—in these days when the taste for keeping birds in confinement is so prevalent—have to increase the British list indefinitely. There are, besides the mere signs of captivity, many things which we ought to consider before admitting a supposed wanderer into the British list. For instance, the habitat, whether near to these islands or distant—if distant, had the bird been found at any intermediate places; how separated, by land or water, whether confined to a small spot or extending over a considerable geographical area; the habits and capabilities of the bird—whether of a wandering nature and possessed of considerable powers of flight—whether migratory, and if so, within what limits—whether, either at its breeding stations or on the journey to or fro it is likely to fall in with flocks of birds bound to these Islands with which it might associate—what the line of migration might be, whether along a coast-line from which, if blown by a gale or wandering in foggy weather, it would probably reach these shores as the first land. Food also may be taken into consideration, as there are some birds which, from the nature of their food as well as from their habits, it is quite impossible to keep in confinement, and therefore they could not be brought to these Islands from any distance by the help of man; others, however, are very easily tamed and fed, consequently may easily be brought any distance with very little care and attention, and would show little or no signs of confinement on their arrival here. On the ground of food alone, there are many birds which we should be disposed at once to admit as *bonâ fide* wanderers, on satisfactory evidence of their having been found here in an apparently wild state. Such, for instance, would be the Alpine Swift, Bonaparte's Sandpiper, and the American Little Stint. As an illustration of some of the foregoing remarks,

we may take the case of White's Thrush, for though its proper home is far distant it is a bird of wandering habits, considerable powers of flight, is migratory within certain limits, and has been taken in several intermediate localities. Prof. Newton, I think, has enumerated about twenty captures on the continent of Europe, and it has been taken several times in England. Under these circumstances, I think, on sufficient evidence of the bird having been taken in an apparently wild state, and with no traces of confinement about it, we should be disposed to admit it; but should a supposed British-killed White's Thrush turn out on examination to be the allied *Turdus lunulatus* of Australia, I think, though the evidence as to the capture might be the same, we should be disposed to reject its claims to be British, on the ground of its still more distant habitat and the greater difficulties which would have to be encountered during the flight, its not having been taken in intermediate places (I believe it has not occurred even in India); moreover, there is only one extremely doubtful occurrence in England—in fact, so doubtful that it is not worth consideration. Numbers alone might be some guide, as in the case of the Sand Grouse, where the birds arrived in such numbers as to preclude the possibility of their all being escapes; some stragglers, however, were taken along the line of route, but in spite of that, had only a few appeared here, we should have been much more sceptical about them as their habitat is distant, and they are not much given to such erratic proceedings, and they can be, and sometimes are, kept in confinement. As to signs of captivity, where such are apparent I should consider them conclusive evidence of the bird being an escape; but where no such signs are apparent I should not at all consider their absence as conclusive evidence of such an event not having happened. Birds are now so well kept, and indeed occasionally allowed such perfect liberty, that no signs of captivity appear about them when they take it into their heads to wander, and, as unfortunately too often happens, are shot and recorded as British specimens. This is very much the case with ducks and other wild fowl. Many Canada Geese were shot about here the winter before last, and not one of those that I saw bore the slightest sign of having escaped from confinement, yet in all probability they were escapes; at least, for my own part I always feel very sceptical about Canada Geese, though the numbers that were then shot rather shook my scepticism. A few Egyptian Geese were also shot at the same time; these probably have a better standing ground than the Canada Geese, but still it is impossible to say that any particular individual which may be obtained is not an escape. To show how soon escapes are made into *bona fide* rare specimens, I may give an instance of my own, which is only one among several. This last spring I lost a Scaup Duck from my pond; three days afterwards I saw the skin at the Taunton Museum, just in time to stop a note to the local papers—and perhaps to 'The Zoologist' also—on the appearance of the

Scaup Duck so far inland. As to advertising, as suggested by Mr. Mathew, it only adds to the expense, and the only satisfaction likely to be obtained is the production of the mutilated remains of the missing bird. But to return to the Somersetshire Purple Gallinule, it is a bird which I think we ought to be very careful how we admit to a place in the British list, for its habitat, though not sufficiently distant perhaps to render its reaching these shores without the aid of man impossible, is sufficiently so to make it very improbable, especially when we take into consideration the habits and nature of the bird, and also the fact that it is easily and not unfrequently kept in confinement, both in public and private grounds. It may frequently be seen in Leadenhall Market, at Mr. Jamrach's, and such places; moreover, very few occurrences have been recorded, and some of these may be referred to *Porphyrio smaragdonotus*, a bird still less likely to have wandered here of its own accord. The original notice in 'Science Gossip,' which was written rather more than a year before Mr. Mathew's note in 'The Zoolologist,' and which I will now quote, seems to point to this bird having escaped, and makes no mention of a second bird having been seen but not taken. It will be found at p. 41 of the volume for 1876, and is as follows:—
"On the 25th of August last a fine specimen of the Hyncinthine Gallinule, *Porphyrio veterum*, was taken in this neighbourhood (Badgworth). It was found in one of our 'rheins,' or running ditches, unable to fly, having apparently been shot at. By the help of a dog it was chased to a hedge and there captured. It pecked savagely at the faces of all who came near it, and one boy, whose curiosity got the better of his caution, received a blow which pierced the lip and wounded the gum. In fact, its bill when wielded with such hearty good—I should rather say ill—will was a formidable weapon. The blue on the neck, breast and belly of the bird is of a very lovely hue. I shall be glad if any of your readers could inform me whether the bird is often found in this country. I have never seen one before. Its wings do not seem well adapted for long flights, and it may have escaped from some private collection. After a day or two's captivity it was killed and stuffed, and is now in the possession of its captors." To this I replied in a subsequent number, giving some little account of the bird and quoting Mr. Harting's very useful 'Handbook of British Birds' as to the number of occurrences, and his opinion that these had "doubtless escaped from some ornamental water," an opinion in which I thoroughly agree, and think we may well include the present specimen in the same category.—CECIL SMITH (Bishop's Lydeard, Taunton).

PURPLE GALLINULES IN ENGLAND.—When enumerating the recorded instances of the capture of some species of *Porphyrio* in this country (p. 227), we accidentally omitted to note the capture of one at Redbridge, near Southampton, in February, 1864, as reported by Mr. Henry Reeks in 'The Zoolologist' for 1866, p. 229.—ED.

DIVERS ON FRESH WATER.—Divers, both Black-throated and Red-throated, are far from uncommon in Scotland, their general range in the breeding season being sufficiently accurately defined for present purposes as “in the north and west.” But they are not, I think, so plentiful as to be considered inhabitants of all or nearly all the larger lochs in these parts of the country (p. 258). Nor is it the case that Divers of either species always prefer the larger lochs for breeding purposes. Even the Black-throated species will be found quite as frequently breeding upon smaller lakes, provided there be a suitable green and grassy shelving island upon it. Sometimes, it is true, they will choose a large loch to breed upon, but their reason for doing so is not, I think, so much for its size as on account of the green, shelving island, upon the edge or rim of which they can make their nest close to the water. Where green and grassy islands do not occur, the general rule holds that upon such lochs no Divers will be found, although exceptions to the rule occur, and have come under my own observation, so rarely, however, as to be noted as quite exceptional by the native gamekeepers and shepherds. Again, two pairs of Divers nesting on one loch is the exception, although it is well known that they sometimes do so. Lastly, Red-throated Divers, according to my experience, rarely, if ever, breed upon the larger lochs, but prefer the quiet, moorland, marshy-edged tarns and “lochan,” often nesting on the shores, and frequenting the larger lochs only in quest of food. Although also found in the West, their distribution would perhaps be more accurately described as northerly and north-easterly on the mainland—rarer in the West, and insular. See my notes on these two species in my “Birds found Nesting in Sutherland” (Proc. Glasg. Nat. Hist. Soc. 1875, pp. 122—124). I may take this opportunity of stating that Divers, and several other of our rarer British breeding species, are still holding their ground well here, being carefully preserved from ruthless and general persecution; whilst some others, especially certain Raptorial birds, as Merlins, Harriers and Buzzards, are decidedly scarcer than they were eight or nine years ago. Others, again of the migratory species, notably the House Martin, are rarer, and have almost deserted the west of the county, whilst a few others, such as the Starling and Song Thrush, have appeared of late years at localities where they were not previously known, and the Chaffinch has become almost common in one locality where it was quite rare before. I hope, at some future opportunity, to put together a few notes on the changes observable in the Avi-fauna of Sutherland during the past eight or ten years. Meanwhile the above rough notes may be acceptable to British ornithologists.—JOHN A. HARVIE BROWN (Dunipace House, Larbert, N. B.).

OCCURRENCE OF THE LITTLE OWL IN SUSSEX.—In ‘The Zoologist’ for May, at page 228, I recorded the capture of a Little Owl near Shoreham on the 15th March last. On the 21st of the following month another was

seen to fly into an old building at Newtimber, in the same county, and being taken alive was sent to Pratt, at Brighton, from whom I obtained it. For some weeks before its capture it had been both seen and heard in the neighbourhood of Newtimber. Mr. Percy Godman, of Shermanbury, informed me that about six weeks previously he saw a Little Owl in a chalk-pit near that place, whilst waiting during a "check" in a run with the South Down Fox-hounds. In all probability it was the same bird. Since it came into my possession, however, I have received information which has considerably marred the pleasure I should otherwise have felt in recording the occurrence of this rare species in Sussex. It seems that in November last two pairs of the Little Owl, which had been in confinement at Knepp Castle, in the parish of Shipley, in this county, were given their liberty. Two were subsequently found dead; the other two, after about a month or six weeks, were not seen again. It is not unlikely, therefore, that these may have been the two specimens which I obtained four and five months afterwards.—WILLIAM BORRER (Cowfold, Horsham).

A BARN OWL IN THE CITY.—A Barn Owl was sitting perched in one of the trees in the churchyard of St. Dunstan's-in-the East, in the city of London, during the 7th, 8th, and 9th of June. These trees are the favourite resort of many hundreds of sparrows, which congregate there every evening to chatter and gossip for an hour or so before they retire to rest.
HENRY TUKE MENNELL (St. Dunstan's Buildings, City).

PIED FLYCATCHER NEAR SALISBURY.—A male bird of this species was seen by Mr. G. A. Tyndale Powell, of Hurdcott House, near here, on Sunday, April 29th. He saw it as he was walking back from church in the morning, and got within six yards of it, so that he could not be mistaken. A second specimen was killed at Herriard, near Basingstoke, in May. This was also a male bird, rather lighter than usual on the back perhaps, and is now in my possession.—ARTHUR P. MORRES (Britford Vicarage, Salisbury).

PIED FLYCATCHER NESTING IN YORKSHIRE.—On the 22nd May last, as I travelled from Barden Tower to Bolton Abbey, a distance of about four miles, I observed above a dozen male and four female Pied Flycatchers. They were all flying about the River Wharfe, and from their unsettled manner it was evident they had only just arrived. Indeed if this species breeds as early as the various authors state in the ornithological works to which I have access, my observations have been unfortunately dull. A few years ago only one or two pairs bred annually in Wharfedale, and their habitat was confined to the north of Bolton Woods. Of late years, however, it has been greatly on the increase, and has extended its range in a southerly direction. In passing through its new breeding haunts, I could not help fearing lest this species, which has bred unmolested in Upper Wharfedale for a great number of years, should be wantonly destroyed by

the numerous persons who frequent the woods in the summer season, as from its confiding habits and the beautiful contrast of the colours of its plumage it cannot fail to attract the attention even of a casual observer.—E. P. P. BUTTERFIELD (Wilsden).

HOBBY NESTING IN HAMPSHIRE.—I visited Wolmer Forest on the 12th of June this year, and found that the day before one of the watchers had shot a Hobby off its nest, which was placed at a considerable height from the ground, in a Scotch fir. The nest contained three eggs. The bird shot proved to be the male, and its stomach contained the remains of a small bird, apparently a Meadow Pipit, *Anthus pratensis*, and some wing-cases of beetles. I was sorry to find that this bird had been shot, and hope in future, should another pair take up their residence in the forest, that they will be left unmolested.—H. W. FEILDEN (Aldershot).

THE LESSER KESTREL NEAR DOVER.—Mr. E. P. Robinson has lately presented to the Dover Museum a specimen of the Lesser Kestrel, *Falco cenchris*, which was caught alive and kept for a short time in confinement by a labourer on his farm in the neighbourhood of Dover. The bird, which proved to be an adult male, had one leg injured, which may have prevented it from taking its natural prey and led to its capture. In appearance it differs a great deal from the Common Kestrel. In the first place it has no markings on the back, the colour being one rich reddish brown. The breast is light red, with a few markings, the more distinct ones being on the thigh-coverts: the head and tail light ash-grey, the latter with a broad black band at the extremity, and each feather edged with white except the two centre ones, which are black to the tips. The claws are white.—CHARLES GORDON (The Museum, Dover, May 22nd).

VARIETY OF THE COMMON GUILLEMOT.—In the North Sea, off the Humber, on the 11th, I observed a pair of Guillemots swimming in company. One was in the ordinary plumage; the other, however, had all those parts normally black-brown, of a light yellowish brown, or rather the colour known to painters as honey-yellow. It was a most peculiar and interesting-looking variety.—JOHN CORDEAUX (Great Cotes, Ulceby).

HOOPOE IN YORKSHIRE.—A fine male specimen of the Hoopoe, *Upupa epops*, has recently been shot at Tockwith, near York, and has been sent to Mr. Ripley, of Feasgate, York, for preservation. From the fact of its being obtained here in June, one might assume that if unmolested it would have bred in the neighbourhood.—J. S. WESLEY (Wetherby, Yorkshire).

[We have no doubt whatever that Hoopoes, like other summer migrants, would nest in this country every year, if people could only be persuaded to abstain from shooting them on their arrival.—ED.]

SINGULAR VARIETY OF THE HEDGESPARROW.—On the 5th June, near Reigate, I saw a light buff-coloured Hedgesparrow sitting on a nest of young ones. A sharp look-out will be kept to ascertain, if possible, what

colour they will grow up. I am told that one of the eggs was abnormally long,—in fact, more than twice as long as any of the others. I have often seen abnormal varieties in size and shape of eggs, but never before connected this with variation in the colour of birds.—J. H. GURNEY, JUN. (Northrepps, Norwich).

HEDGESPARROW'S NEST BUILT IN CABBAGE.—Towards the end of April a nest of the Hedgesparrow was found by a friend in a very curious position. It was built in a large head of cabbage growing in a kitchen garden near Coolock, in the County Dublin. Since then five eggs have been laid, but, when they were partly hatched, the nest was deserted by the parent birds. It is composed of dry pea-stalks, moss, and part of a dry cabbage-leaf, and is lined with hair.—ALFRED E. SHAW (Rathmines School Field Club, Dublin).

TAWNY PIPIT AT BRIGHTON.—On looking over some of my small birds recently, I found a specimen of the Tawny Pipit, *Anthus campestris*, the capture of which I do not think has been recorded. It was taken near Brighton on the 12th October, 1875, and is a young bird, as evidenced by the light edgings to the feathers.—F. BOND (Fairfield Avenue, Staines).

THE BLACKCAP IN COUNTY WICKLOW.—On the 28th April the Blackcap arrived in this neighbourhood, and a day or two subsequently about a dozen might be counted in our woods. My friend, Mr. A. G. More, having some time since directed my attention to the rarity of this bird in Ireland, I brought a specimen to the Royal Dublin Society. About the middle of May they apparently vanished, but a few soon reappeared, and one is certain to detect or hear one or two when walking through a straggling or leafy wood close at hand. That the Blackcap breeds with us I have little doubt, for my sister saw the old birds feeding the young a day or two ago, and pointed the former out to me afterwards. In my opinion it is a regular summer visitant here, arriving at the end of April or beginning of May, for I have both heard and seen it frequently during previous years about that time as well as later on, though by reason of my ignorance as to the position it occupies in the avi-fauna of Ireland, annual records of its occurrence have not been entered. Thompson mentions it from the Vale of Avoca in this county.—R. M. BARRINGTON (Fassaroe, Bray, County Wicklow).

JACK SNIPE IN SUFFOLK IN MAY.—On the 4th of May my brother and I put up a Jack Snipe on the Leiston reed-land. This is the latest stay in spring I have known this bird to make. In the year 1873 I flushed one on the 16th of April.—G. T. ROPE (Blaxhall, Suffolk).

WANT OF REFLECTION IN THE HOUSE SPARROW.—A little more than a month since a pair of Sparrows selected the frame of a sun-blind at the back of my house as a nesting-place; the front part which is attached to the blind projected a little at one end (being slightly warped); this left an

opening by which the birds entered ; the nest was begun at the opposite end. Every morning regularly, for over three weeks, the blind was let down the first thing in the morning, and just as regularly the commencement of the nest fell to the ground ; the two Sparrows watched from the top of the next house nearly the whole of each day, and the moment the blind was pulled up, down they came and began to replace the rubbish in the same place. I tried burying the nest when it fell, but the only result was that, the birds having farther to go for material, the nest was not quite so far advanced on the succeeding morning. Owing to the excessive rains during the past week, the blind was not pulled down as usual for three days, and the birds went on building ; the fall of the nest on the fourth day, when the sun reappeared, seems at last to have disheartened them, and they appear to have discontinued their senseless labours. Are we to look upon this case in the light of a lesson on perseverance in the midst of disappointment, or as evidence of singular absence of reflection on the part of the Sparrows ? If the former, it is as instructive in its way as the story of Bruce's spider ; if the latter, it shows us that *Passerine* intellect is by no means so much developed as some people have imagined it to be.—ARTHUR G. BUTLER (10, Avington Grove, Penge).

BUFFON'S SKUA ON THE CORNISH COAST.—A very nice adult-plumaged bird of this species was sent to Mr. Vingoe for preservation on the 4th June. It had been recently shot near the Lizard—I should think on the morning of the day of its transmission. The middle tail-feathers exceed the lateral ones by just six inches, but the primrose-yellow on the sides of the neck is (as it always has been in specimens under my notice) far paler and less diffused than is represented in illustrations, especially that in 'The Birds of Great Britain.' The colour of the legs is a marked character in this species—the tarsi are slaty blue, thighs and feet jet black, while on the inner side of the tarsus a narrow shoot of black extends upwards an inch from the feet.—EDWARD HEARLE RODD (Penzance).

CANADA GEESE NEAR DUNKELD.—Four Canada Geese (*A. canadensis*) made their appearance on Butterstone Loch in this neighbourhood towards the end of April. They remained on the loch four days, during which time they were in a restless state, constantly flying backwards and forwards uttering their loud trumpeting cry. They did not strike me as being so shy or wary as the other species of Wild Geese, venturing much more boldly near the shores of some small wooded islands than their more cautious relatives would have done ; they were, however, wide awake, and very easily disturbed on the slightest sign of danger.—A. B. BROOKE (Cardney, Dunkeld).

YOUNG CUCKOO IN THE NEST OF A SONG THRUSH.—In June last year I came across a nest of a Song Thrush, in which was a young Cuckoo nearly full-fledged. It had apparently been unable to get rid of the young

Thrushes which still remained in the nest and were crushed flat against the sides by its growth.—ARTHUR G. BUTLER (10, Avington Grove, Penge).

[Instances in which the Song Thrush has been found acting the part of foster-parent to the young Cuckoo, we believe, are rare; and we can only call to mind two authors who have cited cases, Temminck and Des Murs. In the list of foster-parents given by Yarrell the Blackbird is included, but no particulars are furnished.—ED.]

NOTES FROM NOTTINGHAMSHIRE.—During the past winter there has been quite a dearth of rare birds about here; in fact, I cannot remember a winter in which so few birds out of the common way have come under my notice. About the middle of January last an old male Smew, in very fine plumage, was shot on the Thornton Reservoir, near Leicester, and given to me. On the 27th of the same month, when Partridge "driving" at Park Hall near here, a Great Gray Shrike settled on the top of a hedge in front of me, but was off in a second. I fired, however, and knocked it over. It was in quite a Shrike country—small fields and large hedges of thorn. A female Rough-legged Buzzard was shot at Rufford in March; this is the fourth killed there within the past twelve months. On March 17th I saw the Green Plovers begin for the first time their curious flight which they commence just before the breeding season; they were wheeling about in all directions, uttering all the while their wild note. I heard the first Wood Pigeons cooing, and also saw them soaring on March 23rd. The first Snipe was heard "drumming" on the 8th April. On May 16th I saw several Fieldfares still here.—J. WHITAKER (Rainworth Lodge, Mansfield).

STARLINGS NESTING IN SAND MARTINS' HOLES.—I was greatly surprised one day in passing a sand-pit to find that Starlings had taken possession of all the Sand Martin's holes. On coming again a month later most of the birds had young ones. It was very amusing to see the way in which they entered the hole; on getting about 150 yards from the entrance they sailed gracefully into it, giving a few hurried flaps with their wings on gaining the aperture. This year I have also found them nesting in ivy, like Sparrows, which is I believe rather an unusual site. I am of opinion that the Starling is quite as gregarious a bird as his friend the Rook, and that the scarcity of breeding holes alone causes those immense flocks we see in the winter to break up into small companies of two or three pairs in the spring. From a few rough calculations I have made, I find that a pair of Starlings appear to bring food to their young no less than 462 times a day.—C. MATTHEW PRIOR (Bedford).

BREEDING SEASON OF THE EDIBLE CRAB.—In 'The Zoolologist' for June (page 621), Mr. Cornish appears to take it as an established fact that the Edible Crab, *Cancer pagurus*, spawns about the month of January.

I therefore take this opportunity of stating that in the Yarmouth Aquarium there is a specimen of the Edible Crab, which was trawled up from the deep-sea fishing ground by one of the vessels belonging to this port. It was brought to me on the 27th of February, and was then loaded with spawn, which has not yet been deposited. There can be no doubt that the deeper the water from which a Crab is taken, the later will be its spawning time.—C. P. OGILVIE (Yarmouth Aquarium).

HABITS OF THE LOBSTER.—Lobsters at their earliest stages swim at the surface of the water. On the 27th May I procured, for the first time this year, several specimens by lowering from the Britannia Pier a muslin net, and allowing it to remain in the tideway for a few minutes. The capture of these little crustaceans is curious here, because the nearest lobster ground of any importance is at Cromer, distant about thirty-five miles off; thus showing what an immense distance the tide will convey ova and young fish. The hauls I have lately made contain lobsters, possum shrimp, sand-eels, flat-fish, &c.—all in very immature condition.—ID.

INTRODUCTION OF FOREIGN LAND AND FRESH-WATER MOLLUSCA.—With reference to Dr. Tristram's remarks (page 260) respecting the introduction of land and fresh-water shells from abroad, will you allow me to suggest that it might help to solve the problem of the climatic condition of England in the time of palæolithic man, if some one would introduce to British rivers, from the Nile, the *Corbicula (Cyrena) fluminalis* in sufficient numbers to give it a fair chance of becoming acclimatised. *Paludina marginata* and *Unio littoralis* might be more easily brought from France, and as many of your readers well know, they were associated with the *Cyrena* when our rivers were frequented by the Hippopotamus and their banks by Elephants and Rhinoceros and by palæolithic man. The absence of the above-named mollusks at the present time is sometimes used as an argument in favour of the conclusion that the climate was then warmer than now; but it may be, as others suppose, that they perished in England from the cold of the glacial epoch, and have had no opportunity to re-appear.—THOMAS BELT (Cornwall House, Ealing).

THE FAUNA OF THE WEST OF SCOTLAND.—At a meeting of the Natural History Society of Glasgow, held on the 24th April last, a report was submitted from the Committee appointed last session to prepare Catalogues of the Fauna of the West of Scotland, and more particularly of the Clyde Valley. The report stated that arrangements had been made with several zoologists who had undertaken the preparation of lists of species in different departments, and that the first part of the Fauna will appear next autumn in the 'Proceedings' of the Society. The Catalogues will be so arranged that when completed they may be detached if desired, to form a separate volume. We have no doubt the Secretary of the Society will be glad to receive any communications from those who may have already collected

information on the subject, or who may be interested in the proposed publication.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

Annual General Meeting, Wednesday, May 24, 1877.--The customary Address on the occasion of the Anniversary was delivered by the President, Prof. Allman, F.R.S. He took as his subject, "Recent Researches among the Lower Sarcode Organisms," being a continuation of his Address of last year. He dwelt upon the important additions to our knowledge of these organisms due to the investigations of Archer, in our own country, and of Hertwig and Lesser, Franz Eilhard Schulze and Greeff, in Germany. The discovery of many new Monothalamic Rhizopods of fresh water, and the important additions made by the British and German investigators to our knowledge of their protoplasmic bodies, were brought in review before the meeting. These Monothalamic forms may be divided in accordance with the nature of their pseudopodia; in some these processes being short, thick, and finger-shaped (*Lobosa*); in others, long, slim and filiform (*Filifera*). The former were illustrated by *Hyalosphenia*, with its smooth, transparent shell, and of *Quadrula*, with beautifully sculptured shell; and the latter by *Gromia*, with very long filiform reticulated pseudopodia, and by *Microgromia socialis*, which has the curious habit of forming colonies by the association of numerous individuals which become united to one another by the mutual fusion of their pseudopodia. The remarkable form of reproduction discovered by Hertwig in *Microgromia* was also described. Hertwig had shown that in this Rhizopod the protoplasm divides by spontaneous fission into two segments, one of which remains in the shell, while the other forces its way out, assumes an oval shape, develops instead of pseudopodia two vibratile flagella, and becomes a free-swimming flagellate Zoospore, capable of ultimate development into the form of the adult. The very interesting discovery by Haeckel, that the contents of the so-called "yellow cells" of the *Radiolaria* become of a deep violet colour under the action of iodine, and are therefore mainly composed of starch, was also referred to among recent additions to our knowledge of the lower organisms. An account was then given of the remarkable and very significant researches of Messrs. Dallinger and Drysdale among the so-called "Monads"—microscopic organisms which become developed in putrefying solutions of organic matter, and which, in their ordinary and apparently adult state, swim about by the aid of vibratile flagella. These laborious and trustworthy investigators have shown that the flagellate Monads may acquire an amoeboid condition, and move about by the aid of pseudopodia; that two such amoeboid forms when they come in contact with

one another become instantly blended together at the point of contact; that this blending becomes more and more intimate, until the two individuals become completely fused together, when their mingled protoplasm assumes the form of a spherical sac filled with particles of immeasurable minuteness. These particles are germs destined for the reproduction of the individual. Their form can be demonstrated only by the highest powers of the microscope, and by following them by means of a $\frac{1}{50}$ of an inch object-glass. Messrs. Dallinger and Drysdale were enabled to trace their gradual development into the form of the adult. They further proved the remarkable and unexpected fact that these minute germs may be subjected to a temperature of 258° to 300° Fahr. without losing their vitality and power of development—a fact of vast significance in its bearing on the experiments connected with the question of spontaneous generation. Finally, attention was drawn to the quite recent discovery of Hertwig and F. E. Schulze of a nucleus in the *Foraminifera*. By this discovery their true systematic position can now be assigned to the *Foraminifera*, which must accordingly be removed from the region of Cytodes, or non-nucleated protoplasmic masses, to which they had been hitherto relegated, and placed on a much higher stage in the great division of the *Rhizopoda*. Resting on these facts, F. E. Schulze has attempted to represent, by the aid of a genealogical tree, the mutual affinities and derivation from one another of the various members of the *Rhizopoda*. The base of the tree, where its stem is as yet undivided, consists of the primitive forms—mere non-nucleated Cytodes, represented by Haeckel's *Monera* (*Protopenes*, *Protameba*, &c.). From these, by the differentiation of a nucleus in their protoplasm, are evolved the nucleated forms (*Ameba*, fresh-water *Monothalamia*, *Foraminifera*, *Heliozoa*, &c.), which constitute the subdivisions into which the stem branches off. These repeat the various modifications of pseudopodia (lobose, filiform, &c.), which had already existed in the primitive forms, and which they thus derive by inheritance from their non-nucleated progenitors. Finally, through the branch of the *Heliozoa*, we are conducted to the ultimate twigs formed by the families of the *Radiolaria*, in which we find not only nuclei but a “central capsule” indicating the highest grade of differentiation attained by any of the group.

Among purely business matters, the Treasurer (Mr. J. Gwyn Jeffreys, F.R.S.) read his statement of the accounts, &c., of the past financial year. His report was very favourable, showing not only that the Society was gaining ground as to numbers and means, but extending its influence and usefulness in publications, valuable additions to the Library, &c. The handsome donation of £500 of the late Mr. Charles Lambert was duly announced and thanks accorded. During the past year twelve Fellows and five Foreign Members died; and forty-three Fellows, three Foreign Members, and one Associate had been elected.

The following gentlemen were unanimously elected into the Council:—Lieut.-Col. Grant, C.B., Mr. William Carruthers, Mr. Robert Hudson, Dr. John Millar, and Dr. R. C. A. Prior, in the room of the subjoined who retired—Mr. George Bentham, General Scott, C.B., Mr. R. Bowdler Sharpe, Mr. H. T. Stainton, and Mr. Charles Stewart. No change was made in President and officers, all being re-elected.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

June 5, 1877.—Prof. W. H. FLOWER, F.R.S., Vice-President, in the chair.

A communication was read from Dr. A. B. Meyer, enclosing a paper by the late Dr. Bowerbank, describing five new species of sponges, discovered by Dr. Meyer in the Philippine Islands and New Guinea during his recent travels in the Eastern Archipelago.

A communication was read from Mr. E. L. Layard, containing some remarks on the exact localities of certain species of birds of the Islands of the South Pacific.

A second communication from Mr. Layard contained remarks on a paper by Mr. R. B. Sharpe on the *Cuculidae* of the Ethiopian Region.

A communication was read from Mr. Arthur G. Butler, containing an account of a collection of Lepidoptera, made at Cape York and on the South-East Coast of New Guinea, by the Rev. J. S. MacFarlane. Of these five butterflies and four moths were described as new to science.

Dr. A. Günther read a report on a collection of fishes made during the late Arctic Expedition by Mr. Hart, Naturalist on board H.M.S. 'Discovery.' Amongst them was a new species of Charr, from a lake near the winter quarters of the 'Discovery,' which was proposed to be called *Salmo Naresi*.

A communication was read from Mr. D. G. Elliot, containing a review of the genera and species of *Ibidinae* or subfamily of Ibises.

A communication was read from Mr. Martin Jacoby, containing the descriptions of some new species of Phytopagous Coleoptera from various parts of the world.

Messrs. P. L. Sclater and O. Salvin read descriptions of six apparently new species of birds from collections lately received from Ecuador and Peru. Amongst these was a remarkable new duck of the genus *Fuligula* from the vicinity of Lima, Peru, proposed to be called *Fuligula Nationi*, after Prof. Nation, its discoverer.

Mr. A. H. Garrod read the third part of his series of papers on the anatomy of Passerine Birds, and treated specially of some modifications of the tracheophonine larynx, which he had lately ascertained to occur in the genera *Pteroptochus* and *Grallaria*.

Mr. George French Angas communicated notes on a collection of land and fresh-water shells from S.W. Madagascar; amongst these Mr. Angas pointed out three new species of *Helix*, one of *Bulimus*, and one of *Physa*, which he proposed to call *Helix Watersi*, *H. Balstoni*, *H. ekongoensis*, *Bulimus Balstoni*, and *Physa madagascariensis*.

A second communication from Mr. Angas contained the description of a remarkable shell from Japan, which he named *Thatchera mirabilis*; also the description of a new species of *Leiodomus*, from Kurrachi, Seinde, proposed to be called *L. kurrachensis*.

June 19, 1877.—E. W. H. HOLDSWORTH, Esq., F.Z.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of May, 1877, and called particular attention to a Pangolin, *Manis tricuspis*, purchased May 24th, being, so far as was known, the first example of this remarkable form of *Edentata* that had ever reached the country alive; a male of the new Mesopotamian Fallow Deer, lately described and figured by Sir Victor Brooke, in the Society's 'Proceedings,' as *Cervus Mesopotamicus* (see 'Zoologist' for March last, p. 94); and an animal purchased on the 29th May as a Cheetah, but which appeared to belong to a new species of the genus *Felis*, distinct from, although closely allied to, that animal—for this the temporary designation of *Felis lanea*, or Woolly Cheetah, was proposed.

The Secretary read a letter addressed to him by Mr. J. M. Cornély, announcing that his female *Hydropetes inermis* had just produced three young ones.

Mr. J. E. Harting exhibited and made remarks on a variety of the common Snipe, intermediate in colour between the usual form of that species and the so-called Sabine's Snipe. This bird, shot in Ireland and forwarded by Mr. Douglas Ogilby, was described by Mr. Williams in 'The Zoologist' for January last (pp. 23, 24).

Mr. B. Tegetmeier exhibited a specimen of a curiously malformed sternum of the Tawny Owl.

Mr. John Murray, Naturalist to the 'Challenger' Expedition, exhibited and made remarks on a series of Sharks' teeth, Whales' ear-bones, and other specimens dredged up at great depths during the 'Challenger' Expedition.

Mr. P. L. Sclater read the first of a series of reports on the collection of birds made during the voyage of H.M.S. 'Challenger,' containing general remarks on the collection, which was stated to consist of about 679 skins of terrestrial and 198 of oceanic birds, besides a considerable series of specimens in salt and in spirit, and a collection of eggs, principally of the oceanic species.

A communication was read from the Marquis of Tweeddale, containing a report on the collection of birds made during the voyage of H.M.S. 'Challenger' in the Philippine Islands. Amongst them were examples of seven species new to science.

Mr. P. L. Sclater read a paper giving a description of the birds collected at the Admiralty Islands during the visit of the 'Challenger' Expedition to that place. Amongst these were examples of six species hitherto unknown to naturalists.

A communication was read from the Rev. O. P. Cambridge on some new species of *Araneidea*, with characters of two new genera, and some remarks on the families *Podophthalmides* and *Dinopides*.

A note was read by Mr. J. H. Gurney on the breeding of the Polish Swan in captivity, and on the stages of plumage of the young birds.

A communication was read from Mr. F. Moore, in which he gave a complete description of the Lepidopterous fauna of the Andaman and Nicobar Islands, so far as is yet known.

A communication was read from Mr. Herbert Druce, containing a revision of the Lepidopterous genus *Paphia*, with descriptions of twenty-one new species.

A communication was read from Mr. E. J. Miers, containing the description of a collection of Crustacea (*Decapoda* and *Isopoda*), chiefly from South America, with descriptions of new genera and species.

Mr. A. H. Garrod read a description of the brain of the Sumatran Rhinoceros, *Ceratorhinus Sumatrensis*.

A paper by Mr. A. D. Bartlett contained the description of a new Guinea-fowl, from Mombassa, in Eastern Africa, based on a specimen brought home by Mr. Gerald Waller, for which the name *Numida Elliotti* was proposed.

This meeting closed the Session. There will be no more Scientific Meetings until the commencement of the next Session in November next.—

P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

June 6, 1877.—J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the chair.

M. René Oberthür, Rennes, France, was balloted for and elected a Foreign Member.

Mr. J. W. Douglas exhibited the following insects:—

Psylla sylvicola, Leth. On birch trees, Sevenoaks, July.

„ **betulae*, Linn. On birch trees, Dunkeld, August.

„ *pruni*, Scop. On fir trees, Addington Hills, October.

- **Psylla peregrina*, Först. On mountain ash, Perth, August.
- ,, *costalis*, Flor. On larch, Edinburgh, August.
- ,, *spartiophila*, Först. On broom, Plumstead, June.
- ,, *simulans*, Först., and **P. pyricola*, Först. On pear trees, Perth and Roslyn, August.
- ,, *eratægi*, Först. On pear trees, Roslyn, August.
- ,, **Scotti*, Löw. On fir trees, Addington Hills, October.
- ,, *hippophaës*, Först. On *Hippophaë rhamnoides*, Folkestone, August.
- Trioza urticae*, Linn., *T. hæmotodes*, Först., and *T. albiventris*, Först. On fir trees, Addington Hills, October.
- ,, *Walkeri*, Först. On buckthorn, Dartford, October.
- Aphalara polygoni*, Först. On *Rumex acetosella*, Sevenoaks, July; and on fir trees, Addington Hills, October.

In all sixteen species of *Psyllidæ* taken by him during the latter half of 1876, whereof four (*) are new to Britain. Mr. Douglas called attention to the wide field the *Psyllidæ* offered for the discovery of new species and observation of economy, the variety in the latter being very great, some species rolling or deforming leaves, some exuding a waxy secretion, and others living free. The natural history of many species is quite unknown, and the rearing of any from the egg or larva to the perfect state was commended to the attention of entomologists, especially of those who have reared Lepidoptera, as being equally interesting with insects of that order, and furnishing an area for investigation as yet but little occupied.

Mr. F. Grut exhibited a white downy nest from Jamaica, supposed to be produced by some insect.

Mr. H. Goss exhibited a dark variety of *Cleora glabaria*.

Mr. C. O. Waterhouse exhibited a new species of dragon-fly from Borneo, belonging to the genus *Gynacantha*, which he proposed to call *G. plagiata*. It differed from all its congeners, not only in its great size, but in the unusual colouring of the wings, which were hyaline, with the whole anterior border as far as the stigma broadly margined with pitchy brown, and with a large patch of the same colour, only darker, across each wing near the apex; this patch on the hind wings extended a little along the posterior border. The total expanse of the wings was $6\frac{1}{2}$ inches; the length of the posterior wing, $3\frac{1}{2}$ inches. The specimen was a female.

The Secretary read a circular from Dr. Buchanan White, of Perth, asking entomologists to assist him with specimens of Hemiptera (especially exotic), as he was engaged in working out that order of insects.

Dr. Sharp communicated a note on the classification of the Rhyncho-phorous series of Coleoptera.

Mr. J. W. Slater communicated a paper, "On the Food of Gaily-coloured Caterpillars," in which he attempted to show that brightly-coloured larvæ generally fed on plants which were poisonous.

Mr. M'Lachlan stated that the bright coloration of larvæ was no protection from the attacks of ichneumons. He also remarked that the larva of *Diloba ceruleocephala* was found feeding sometimes on sloe and sometimes on laurel, and raised the question whether specimens found on the latter plant would be poisonous, and those on the former innocuous.

Mr. Meldola stated that, with regard to the chemical aspect of the question, he believed it possible for a poisonous substance derived from a food-plant to permeate the tissues of a caterpillar without undergoing any change. The evidence upon which this statement rested was to be found in the fact that the colouring matters of some plants had been found by means of the spectroscope in the tissues of larvæ which fed upon them in an unaltered condition. If colouring matters escape the digestive processes unaltered it is probable that organic poisons would do the same. On the other hand, it is well known that larvæ feeding on non-poisonous plants may elaborate poisons by chemico-physiological processes. The larva of *Liparis auriflua*, which feeds upon hawthorn, sloe, apple, oak, &c., and which possesses the well-known property of "urticating," was adduced as an example.

Mr. M'Lachlan remarked that it was now generally admitted that the urticating property was due to mechanical irritation, the numerous brittle hairs of the larva entering the skin.

Mr. Dunning and Mr. Waterhouse raised the question whether the hairs thus penetrating the skin might not possess some poisonous quality.

Mr. Meldola further remarked that he had observed that certain distasteful species of Lepidoptera preserved their disagreeable qualities after death, in proof of which he exhibited some butterflies found among an old collection of Indian insects, the greater part of which had been demolished by mites. The surviving specimens were all of protected species, viz. four of a *Euplæa*, one of *Danais plexippus*, and one of *Papilio Pammon*. *Euplæa* and *Danais*, were well known to be protected genera, since they serve for models of mimetic resemblance. With regard to *Papilio Pammon*, Mr. Meldola stated that in his belief it was in some way distasteful, as he had seen it in swarms in the island of Nancowry, Nicobar Islands, in April, 1875.

Mr. M'Lachlan stated as a contrary fact that *Cantharides* is particularly subject to the attacks of beetles.

With regard to the means by which bright coloration might have become associated with poisonous qualities in a larva, Mr. Meldola reminded the Society of the experiments of Messrs. Jenner Weir and A. G. Butler, communicated to them in 1869. These gentlemen had proved that brightly-coloured, hairy and spiny caterpillars were generally distasteful, while dull species were devoured. Mr. Wallace was of opinion that the observed correlation between bright coloration, &c., and distastefulness was brought about by means of Natural Selection. Mr. Meldola quoted the following

passage from Mr. Wallace's 'Contributions to the Theory of Natural Selection':—"Distastefulness alone would, however, be of little service to caterpillars, because their soft and juicy bodies are so delicate that if seized and afterwards rejected by a bird they would almost certainly be killed. Some constant and easily perceived signal was therefore necessary to serve as a warning to birds never to touch these uneatable kinds, and a very gaudy and conspicuous colouring, with the habit of fully exposing themselves to view, becomes such a signal, being in strong contrast with the green or brown tints and retiring habits of the eatable kinds." (See also Proc. Ent. Soc., March 4, 1867.)

During the meeting the Rev. A. Eaton stated that he had observed a male specimen of *Colias Edusa* in Dorset on June 3rd. Mr. S. Stevens had likewise seen six specimens near Gravesend on June 4th.—R. MELDOLA,
Hon. Sec.

NOTICES OF NEW BOOKS.

Zoological Classification: a Handy Book of Reference, with Tables of the Subkingdoms, Classes, Orders, &c., of the Animal Kingdom, their Characters, and Lists of the Families and principal Genera. By FRANCIS P. PASCOE, F.L.S. London: John Van Voorst. 1877. 12mo. pp. vi., 204.

WHOLESALE it is for specialist workers in Natural History to have their attention every now and then diverted from their particular object of study, not merely to the investigations of their brethren in kindred branches, but directed to the results at which generalizers are arriving. In this way the first are led by successive steps to wider and wider notions, so as gradually to realize the conception that there are other nuts in the world beside the narrow cell in which each, maggot-like, has been existing; and this discovery cannot fail to make the specialist's labour more useful by showing him how he can turn his efforts so as best to aid the systematist.

Mr. Pascoe then, in this little book, has set an excellent example, and it is one that requires a certain amount of courage to set. So divided and subdivided have become the multitudinous branches of Zoology, and to such an extent has the special knowledge of some of them been pushed, that in these days it is quite certain that nobody can draw up a general Classification which shall pretend to enter into any detail without almost all specialists, on taking it up,

discovering that each in his own particular line knows more than the author does of that line, and if some two or three such specialists talk over the book together they are apt to come to the conclusion that the poor author has not been very successful in his undertaking. Now this conclusion is not necessarily just, and it certainly would not be just in the present case. Of course we should have no difficulty in pointing out several passages wherein we are aware, either from our own knowledge or from the information of expert friends, that Mr. Pascoe is behind the existing state of science, or has not reproduced in the most accurate manner the results at which the latest workers on some particular groups have arrived; but that would be an ungracious task, and one from which we gladly abstain. We must not compare the general systematizer with the specialist, but with other general systematizers. We need mention no names, but we have made the comparison, and from it, we think, Mr. Pascoe comes out very fairly. There never has been a system, and in our day we never expect to see one, that could stand a test so severe as some would impose. We might say that all would like to impose, because it is clear that to impose such a test with reason can only come to pass when Zoology is far further advanced towards perfection than, in spite of its legions of votaries, there is any chance of happening for a long time.

Mr. Pascoe's book can hardly fail to be useful. Without being able to pronounce it a very extraordinary production, we are bound to say that it has some great merits. To take even the lowest view of it, and to treat it merely as an Index to the Animal Kingdom we do not hesitate to say that the author deserves well of his zoological brethren for having published it. Every one knows how new genera and larger groups are being multiplied day by day, and how it is becoming almost impossible for a man, even of the greatest zeal, to keep himself sufficiently informed of these matters to read intelligently an article in any periodical that treats of Natural History generally. This handy little book will often supply the knowledge wanted, when a work of greater pretension would be troublesome to consult or perhaps not available for reference till the occasion for using it had passed away. Should Mr. Pascoe, as we hope he may, have the opportunity of bringing out a new edition, perhaps he will pardon us for suggesting that he would do well to submit the pages containing each group to the best authority thereupon that he can find. We are sure he would thus

have no difficulty in making some important improvements. We think he would be told that *Galeopithecus* (p. 183) is now well recognized as an Insectivore, and perhaps he may be converted from that dangerous heresy which teaches that the *Sirenia* (pp. 178, 179) form only a family (*Manatidæ*) of the *Cetacea*. Perilous, too, is the position of that man who doubts "the absolute agreement among ornithologists" not to consider the *Saururi* lower (instead of higher) than the *Pici* (p. 152), and Dr. Günther's latest views on the arrangement of Fishes are certainly not those which have been followed (p. 130). But we must not criticize in detail. There seems to have been more than ordinary care bestowed on the printing, but some blemishes we cannot help noticing. We should like to know the authority for the spelling *Ryngota* (p. 78), which appears to be intentional, and we may observe that the name of the wonderful new genus of Leptocard Fishes last year described by Prof. Peters* was called by him *Epigonichthys*, and not *Epizomethys*, as Mr. Pascoe has it (p. 131), following an unlucky misprint in 'Nature' (vol. xv. p. 66).

Our readers, or some of them, we know, are not partial to over much science. But they must recognize the fact that they form part of a very large army, and the other fact that no army is good for much unless composed of what are technically called the three "arms" of the service in due proportion. All three must know their drill, or in other words should be versed in Anatomy; and then of the three "arms," there are first the physiologists and embryologists, who may be compared to the artillery and engineers; next, representing the infantry, are the cabinet-workers, including the nomenclaturists—a small but useful class who may be likened to pioneers, from the necessary and thankless office they discharge; and lastly, the field-naturalists, whose best similitude may be found in the cavalry, not only from their discursiveness, but from the way in which they crown a victory by a rapid charge when the ground is won. We are not of those who think that the need of field-naturalists will ever be lessened through the work of their less rapid brethren, and the more cavalry are acquainted with the tactics of their fellow-soldiers the more brilliant and effective will be their operations.

* Monatsbericht Acad. Berlin, 12 June, 1876.

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ON THE MAMMALIA OF NORTH GREENLAND AND GRINNELL LAND.

By H. W. FEILDEN, F.G.S., C.M.Z.S.

ON the 29th July, 1875, the Arctic Expedition,—H.M. Ships 'Alert' and 'Discovery,'—under the command of Captain G. S. Nares, R.N., passed from the north-water of Baffin Bay into the ice of Smith Sound. On the 1st September, 1875, the 'Alert' reached the limit of navigation, in latitude $82^{\circ} 27'$ N., on the northern shore of Grinnell Land, the 'Discovery' having previously found winter-quarters in a commodious harbour on the western side of Robeson Channel, in $81^{\circ} 44'$ N. lat. In the following year, 1876, sledging expeditions were pushed out due north over the frozen sea, and also along the coast lines east and west, whilst subsidiary sledging expeditions examined various portions of coast line and penetrated, where possible, into the interior. All the officers employed in these expeditions took a lively interest in the zoological results of the voyage, and I am indebted to one and all for their ready assistance. A large extent of country was carefully worked, and I am quite confident that no species of mammal escaped our united observations. In the end of July, 1876, after an imprisonment of eleven months, the 'Alert' broke out of winter-quarters, and again rounding Cape Union joined her consort at Discovery Bay. Together the two vessels made the perilous passage down Smith Sound, and on the 10th September reached the north-water, and comparative safety, of Baffin Bay.

Homo grænlandus.—The most northern known inhabitants of our globe are the Eskimo that dwell along the coasts of North Greenland between Cape York, the northern extremity of Melville Bay, and the great Humboldt glacier, which discharges into Smith Sound on its eastern side, between the seventy-ninth and eightieth parallels of north latitude. These *εσχατοι αρδην* were first brought to notice by Captain Sir John Ross, who discovered them during his voyage to Baffin Bay in 1818, and they were called by him the "Arctic Highlanders." Since then Dr. Kane, Dr. Hayes and Dr. Bessels, with their different Expeditions, wintered in the vicinity of these people, and have published graphic and interesting accounts of their habits and ways of life. The most northern settlement of these Eskimo at the present day is Etah, on the northern shore of Foulke Fiord, from whence the hunters of the tribe travel along the Greenland coast as far north as the southern edge of the Humboldt glacier, a little beyond the seventy-ninth degree. That they also at times cross the Sound and visit the opposite shores is evident from Dr. Bessels having reached latitude $79^{\circ} 16'$, on the east coast of Grinnell Land, by sledging, in company with two of the Etah Eskimo, on April 16th, 1873.* In 1875, I found at Cape Sabine the remains of several ancient Eskimo encampments, but nearer to the shore traces of a recent visit, a blackened fire-place made of three stones placed against a rock, with the hairs of a white bear sticking to the grease-spots, an harpoon with iron tip, and the *excreta* of the dogs who had fed off the bear's hide. Further north, on the shores of Buchanan Strait, we came upon deserted settlements containing the ruins of many "igloos"; in one instance the ribs of a large cetacean had been used as rafters to a hut; bones of Reindeer, Musk-ox, White Bear, Seal and Walrus were strewed around, and I picked up several articles of human workmanship, both in bone and ivory. Still further north, Norman Lockyer Island, in Franklin Pierce Bay, at some distant period, must have been the home of numerous Eskimo. On the 11th August, 1875, I landed and walked along the northern shore of this island for some two miles; it was strewed with the bones of walrus, whilst skulls of this animal were lying about in hundreds, all broken more or less by human agency, in every instance the tusks having been extracted. Skulls of *Phoca barbata* and *P. hispida*, broken at the base in order to extract the brain,

* Report Sec. U.S. Navy, 1873, p. 537.

were numerous, and I came across fragments of the skeleton of one cetacean. Patches of green moss marked the sites of ancient habitations, and circles of stones summer tents, whilst numerous stone "caches" and cooking-places, now overgrown with moss and lichen, but containing calcined bones, bore silent witness to the former presence of inhabitants. At various points of Grinnell Land, still further north, notably at Cape Hilgard, Cape Louis Napoleon, Cape Hayes and Cape Fraser, I came across old traces of Eskimo. At Radmore Harbour, in $80^{\circ} 25'$ N. lat., I found the ruins of another large settlement, apparently as long deserted as the one on Norman Lockyer Island. After removing the green moss and overturning some of the large stones that had once formed the walls of the "igloos," I discovered several interesting ivory relics. On Bellot Island, at the entrance of Discovery Bay, $81^{\circ} 44'$ N. lat., were several rings of lichen-covered stones that marked the sites of old encampments, fragments of bone and chips of drift-wood being strewn around. A few miles south of Cape Beechey I found more circles of tent-stones; and near at hand a small heap of rock-crystals and flakes showed where the artificers in stone had been making arrow or harpoon heads. Close under Cape Beechey, and about six or seven miles from the eighty-second parallel, I came across the most northern traces of man that have yet been found; they consisted of the frame-work of a large wooden sledge, a stone lamp in good preservation, and a very perfect snow-scraper made out of a walrus-tusk. Taking into consideration that where I found these relics is at the narrowest part of Robeson Channel, not more than thirteen miles across, and that a few miles to the south, near Cape Lupton, on the opposite shore of Hall Land, the 'Polaris' Expedition found traces of summer encampments, I am inclined to believe that this must have been the spot selected for crossing over the channel, and, owing probably to the difficult and dangerous nature of the ice to be encountered, the heavy sledge and *impedimenta* had been left behind. It may perhaps have marked the *ultima thule* of human advance, and of a cruel destiny that forced poor beings to render up their lives at the altar of discovery, under the light of the midnight sun. This thought crossed my mind as I came across these relics, and human imagination can scarcely depict a spot more wild or more weird than that I then gazed on, or one more befitting the enactment of such a tragedy. Northwards from this point no trace of man was

discovered by any of our parties, neither westward along the northern shores of Grinnell Land, or eastward along the coasts of Greenland that border the Polar Basin. I am quite convinced that the men whose tracks we followed as far as the eighty-second degree never got round Cape Union. Even in the short summer of July and part of August animal life is too scarce there to support a party of travelling Eskimo, whilst the idea of winter residence is beyond consideration. In my opinion it is impossible for any Eskimo to have rounded the northern shores of the Greenland continent, and the presence of the tribe seen by Sabine and Clavering on the eastern coast of Greenland may easily be accounted for by their having rounded Cape Farewell from the westward. It is well known that formerly considerable numbers of Eskimo were living to the eastward of Cape Farewell, but year by year stragglers and small parties from these outside savages have re-entered the Danish colonies to the westward of Cape Farewell, and become absorbed amongst the civilized Greenlanders. This slow but steady return to the southward fully accounts for the German Polar Expedition of 1869-70 not meeting with the Eskimo tribe seen by Sabine on the east coast. The result of my observations amounts to this, that along the shores of Smith Sound, Kennedy Channel, Hall Basin and Robeson Channel, three degrees north of the present extreme range of the Etah Eskimo, the most northern race of men known, there are to be found not only traces of Eskimo wanderings, but many proofs of former permanent habitation in places where under present climatic conditions it would be impossible for even the "Arctic Highlanders" now to exist.

Ursus maritimus.—There is little to tempt this animal from the comparatively rich hunting-fields of the north-water of Baffin Bay to the dreary shores of Smith Sound and northward. A single Bear was killed by Dr. Bessels, of the 'Polaris' Expedition, in Petermann Fiord, and foot-marks were observed by members of our Expedition near Thank God Harbour; and along the coast of Grinnell Land between the winter quarters of the 'Alert' and 'Discovery,' we also saw foot-marks in the neighbourhood of Cape Hayes. At the present day I do not imagine the White Bear ever enters the Polar Basin through Robeson Channel. The cranium of a very large example was found by Captain Markham on the northern shores of Grinnell Land in latitude $82^{\circ} 30'$ N., some

distance from present high-water level. I think it is not improbable that this specimen may have been washed out of the mud-beds which fill up the valleys of that region to an altitude of several hundred feet, and from which I have taken the remains of Seal, Musk Ox and other animals, with abundance of drift-wood and the shells of most of the Mollusca now inhabiting the adjacent sea. If I am right in this surmise, there is no saying from what distance or from what direction this cranium may have been brought on an ice-raft.

Mustela erminea.—The Ermine has followed the Lemming, *Myodes torquatus*, throughout its northern migrations to the shores of the Polar Basin, and crossing Robeson Channel in company with this little rodent has invaded North Greenland, where Lieutenant Beaumont, R.N., secured an example during his sledge journey in latitude 82° 15' N. It doubtless extends as far south on the eastern shore of Greenland, where it was found by the Germans, as the range of the Lemming. I obtained specimens in Grinnell Land as far north as 82° 30', and several examples were shot near Discovery Bay. It is hunted and killed by the Arctic Fox. We noticed the tracks of this little animal in the snow on the re-appearance of sun-light, and remarked that it is infested by a tenia.

Canis lupus.—This animal was not met with by Dr. Bessels in Hall Land, and consequently I hardly expected to meet with it still further north in Grinnell Land. However, on the 1st April, 1876, several Wolves made their appearance in the neighbourhood of the winter quarters of the 'Alert.' They were evidently following a small herd of Musk-ox, whose tracks and traces were observed in the vicinity. That the Wolves are able at times to secure these animals was shown by their droppings being composed chiefly of Musk-ox wool and splinters of bone. Several of our sportsmen started in pursuit of these Wolves, but with one exception they did not allow any one to approach them within three or four hundred yards. The exceptional Wolf followed Captain Markham, who was unarmed, for more than two miles, no doubt attracted by the retriever bitch that accompanied that officer. These Wolves were larger than the largest of our Eskimo dogs, and of a light gray colour, with long fur and drooping tail. They agreed well with the description by Richardson of *Canis lupus-occidentalis*. The following day, April 2nd, the Wolves still continued in the neighbourhood of the ship, and at intervals their long, melancholy, but

not unmusical wail reverberated from the hills. After this date we saw no more of these animals till the 25th May, when a single individual followed the sledge I was with for several days as we travelled along the coast. It was a most cunning beast, and eluded all our endeavours to get a shot at it. Subsequently I procured a cranium and part of the skeleton of one of these animals, which was picked up by a sailor of the ship. This animal is infested by a species of tenia.

Vulpes lagopus.—The Arctic Fox decreases in numbers as we proceed up Smith Sound. One was shot on the ice near Victoria Head, Grinnell Land, which was prowling around the ship, and more than one specimen was obtained near the winter-quarters of the 'Discovery.' At Floe-berg Beach, the winter-quarters of the 'Alert,' foot-prints of the Fox were occasionally seen in the snow, but it was not till the 13th July, 1876, that I obtained a specimen in the flesh. On that occasion Lieutenant Parr, R.N., and I were out on a hunting expedition, our tent being pitched at Dumbell Harbour, some miles north of Floe-berg Beach, and from it we made daily incursions up the valleys leading to the uplands in hopes of meeting with big game. On the date above mentioned we had ascended to an altitude of eight hundred feet above the sea, and had emerged on a great plateau which stretched for several miles towards a range of mountains. The snow had melted from more than one-half of its area, the surface being composed of splintered slates, which rendered walking very disagreeable and very severe on shoe-leather. A few Knots, *Tringa canutus*, rose wild from pools of snow-water, and tempted us to continue our journey along this dreary upland, in hopes of finding a nesting pair. Soon heavy snow began to fall, and the mist came tearing down from the mountains enveloping us. We steered then by compass, but occasionally the sun and wind dispersed the mist and gave us good sights of the mountains, by which we corrected our bearings. All of a sudden we were startled by the sharp bark of a Fox. More than a year had elapsed since we had heard such a sound. It seemed very close to us, and as the fog lifted we saw the animal standing on a little hill of piled-up rocks that rose like an islet from the plateau. Separating we approached the Fox from opposite directions. Parr fired at it, when it dropped down and crawled below some heavy rocks: out rushed the female from its lair, and we secured her. These animals in summer garb

are very different to the snow-white skins which we usually associate with Arctic Foxes. The hair on the back and brush is of a dirty rufous tinge, on the belly yellowish white. The flora in the neighbourhood of this den was wonderfully rich, the soil having been fertilized by the presence of the Foxes. Several *Saxifrages*, a *Stellaria*, a *Draba* or two, and two or three kinds of grass were in bloom, and the yellow blossom of the *Potentilla* brightened the spot. As we rested there, many little Lemmings popped up from their holes, and undismayed by our presence commenced feeding on the plants. We noticed that many dead Lemmings were scattered around. In every case they had been killed in the same manner, the sharp canine teeth of the Foxes had penetrated the brain. Presently we came upon two Ermines killed in the same manner: these were joyful prizes, for up to this time we had not obtained these animals in northern Grinnell Land. Then to our surprise we discovered numerous deposits of dead Lemmings. In one out-of-the-way corner under a rock we pulled out a heap of over fifty dead Lemmings. We disturbed numerous "caches" of twenty and thirty, and the ground was honey-combed with holes that each contained several bodies of these little animals, a small quantity of earth being placed over them. In one hole we found the major part of a Hare carefully hidden away. The wings of young Brent Geese, *Bernicla brenta*, were also lying about; and as these birds were at that date only just hatching, it showed that they must have been the results of successful forays of prior seasons, and that consequently the Foxes occupy the same abodes from year to year. I had long wondered how the Arctic Fox existed during the winter. Prof. Newton had already suggested, in his 'Notes on the Zoology of Spitzbergen,' that the Fox probably made some provision for winter sustenance, and I was much pleased by finding these large deposits of dead Lemmings and other animals, unquestionably bearing out the same views. It is also a very beautiful arrangement that the increased flora induced by the presence of the Foxes should be the means of attracting and sustaining the Lemmings in the immediate vicinity of the Foxes' den. The Arctic Fox, although I subsequently saw a second pair in the same neighbourhood, may be considered somewhat rare in the northern part of Grinnell Land. The specimens obtained did not differ in size from those killed further south.

Myodes torquatus.—This species of Lemming was found in great abundance along the western shores of Smith Sound, and was traced by our explorers to the eighty-third degree of north latitude and to the extreme western point attained. On the Greenland shore it was found at Thank God Harbour by members of our Expedition, where it had previously been obtained by Dr. Bessels, and traces of it were noticed by our sledge parties who travelled along the northern shores of Greenland. There can be no doubt that the eastern migration of this animal has been across Robeson Channel and around the north coast of Greenland to Scoresby Sound on the east coast, from which locality this animal was brought by Captain Scoresby in 1822. Apparently its southern range on the west coast of Greenland is stopped by the great Humboldt glacier. This Lemming is a great wanderer: we found it on the floes of Robeson Channel at considerable distances from land, sometimes in a very exhausted state, but generally dead. Its habit of leaving the shore and wandering over the ice fully accounts for the skeleton of one of this species being found on a floe in latitude $81^{\circ} 45' N.$, sixty miles from Spitzbergen, by Sir J. C. Ross during Parry's memorable attempt to reach the North Pole in 1827. The peculiar formation of the claws in this species is not permanent; that is to say, it is to a considerable extent seasonal. During the greater part of the year, when the ground is covered with snow, and the animal has to seek its food below the surface of the snow, the claws on the fore-feet attain a great development, and are used in burrowing through the snow. By the month of July, when large areas are bared of snow, and the Lemming, feeding on plants in the open, seeks shelter under rocks or by scratching holes in the earth, the lower portion of the nail on the fore-foot becomes obliterated, either being worn by contact against the hard earth or else gnawed off by the animal. The young have sharp-pointed claws on their fore-feet, and from an examination of a large series of adults of both sexes I find that the summer alteration in the shape of the claw is the same in both sexes. The month of March was the earliest date by which we had sufficient light to enable us to secure these animals, and at that season their coats were white on the outside, changing to slate-blue underneath. The food of this Lemming consists of vegetable substances, especially the buds of *Saxifraga oppositifolia*. It makes nests of grass in the snow, which we often found during

summer as the snow thawed : in most cases large accumulations of the dung of these animals were lying close to the nests. I see no reason to suppose that this animal hibernates, for on the return of light, with a temperature at -50° and a deep mantle of snow covering the land, the Lemming was to be seen on the surface of the snow, close to its syphuncle, blinking at the bright rays of the sun, and during the depths of winter there could be no greater difficulty in procuring food than in March. Sometimes I came across the Lemming at some distance from the hole by which it retreats to its galleries under the snow, and it was interesting to see the rapidity with which it could disappear, throwing itself on its head, its fore-paws worked with great rapidity, rotating outwards, and throwing up a cloud of snow-dust some six inches high. Later on in the year I have seen a Lemming baffle the attempts at capture of a Long-tailed Skua, *Stercorarius longicaudatus*, by the same tactics. The female brings forth from three to five at a birth in June and July, making a comfortable nest of grass for their reception.

(To be continued.)



THE BIRDS OF THE MOY ESTUARY AND THE SURROUNDING DISTRICT.*

BY ROBERT WARREN.

Order NATATORES.

Wild Swans, *Cygnus ferus* or *Bewickii*.—Are often observed during winter on their passage to the mountain loughs of Erris, but only occasionally seen on the tidal parts of the Moy. I first met with them on the estuary during the severe winter of 1860 ; on the 28th December I observed three Swans, amongst a large flock of Wigeon, feeding on the *Zostera* along the Moyview shore. It being flood-tide they fed closer to the land as the water deepened, and as I watched them from behind a fence I remarked that they occasionally uttered a low sweet note. After some time the flowing tide brought them within range, and although I severely wounded two by the same shot, one having a broken wing, they unfortunately got away. My dogs, never having seen such large birds before,

* Concluded from p. 290.

were afraid to follow them, and my boat lying under several feet of snow I was unable to launch her in time to secure them. On the 30th of the same month a flock of twenty were seen flying up the river, closely followed by five more. In January, 1867, I remarked a solitary bird on the river, and heard others calling as they passed overhead in a thick fog. On the 27th December, 1870, a large flock of between thirty and forty birds were seen resting in the channel near Scurmore; they remained until about three o'clock, when they all rose from the water and flew across the country in the direction of Lough Conn, and on the following morning about ten o'clock a flock of thirty, coming from the north-east, were seen flying in the same direction. On December 4th, 1871, I observed twenty birds in the estuary near Ballyskeery. I followed them in my punt, but was unable to get within range, owing to the wariness of the largest bird in the flock. This bird when he saw the boat began to call, and then, closely accompanied by two cygnets, swam off, followed by the others; but wherever he went the two cygnets kept quite close and never attempted to follow any others of the flock, the large bird very probably being the parent of the cygnets. I cannot feel certain whether the swans seen are the great Wild Swan or Bewick's, but from their call-note and size I am inclined to think them the latter species, the call-notes I have heard more resembling the words "awe, awe, awe" than the "whoo—whoo—whoo" of the Whooper.*

Bean Goose, *Anser segetum*.—A regular winter visitant, but met with in much smaller numbers than the next species, which is the most numerous of all the inland-feeding geese in this district.

White-fronted Goose, *Anser albifrons*.—Very common in suitable localities. I have seen them as early as the 29th September and as late as the 25th April, and have been told of their remaining up to May 1st. All through the winter several flocks pass over this place twice daily to and from their feeding grounds. They generally rest by day on the wide expanse of flat bog lying at the foot of the Ox Mountains, County Sligo, and just before dusk cross over into the County Mayo to feed about Rarooyeen Lake and the swampy lands near Mullifarry. I have only twice seen them on the tidal part of the river; but the great haunt for geese is near Foxford on the wide expanse of meadows along the River Moy.

* In Ireland Bewick's Swan is said to be much commoner than the Whooper, c.f. Thompson, 'Birds of Ireland,' vol. iii. p. 17.—ED.

Bernicle Goose, *Anser bernicla*.—Very rare in this district. In October, 1867, a solitary bird for several days frequented the Moy-view shore, but I was unsuccessful in obtaining it. It was afterwards shot by a neighbouring farmer. Captain Dover informed me that when punt-shooting at Drumcliffe, Sligo Bay, he occasionally fell in with small flocks of this species.

Brent Goose, *Anser brenta*.—Occasionally seen in the Bay and Estuary, but seldom remains longer than a day or two, for there are no beds of *Zostera* where they can feed by day undisturbed, the only beds being so close to the village of Ballysokeery that even the Wigeon scarcely ever feed on them except at dusk or during the night. The chief haunts of the Brent Geese on the Mayo coast is Blacksod Bay, near Bellmullet, where they may be seen in thousands throughout the winter.

Shelldrake, *Tadorna vulpanser*.—Has again become resident of late years. Since 1873 a pair have reared their young every season in the Bartragh rabbit-burrows, though previous to that date I only remember seeing them in winter. The cause of their return to the old breeding haunts may be attributed to the strict preservation of the warren by the owner, Captain Kirkwood, who since he has taken up his residence at Bartragh House has most carefully preserved the island from summer poachers.

Shoveller, *Anas clypeata*.—Very rare, and has only once come under my notice. On January 1st, 1862, I observed a fine adult male Shoveller amongst a flock of Wigeon on the river. In November, 1870, Capt. Dover, when punt-shooting near Bartragh, shot a beautiful pair, male and female, which he presented to the Royal Dublin Society's Museum.

Wild Duck, *Anas boschas*.—Very common in the district. A few small flocks are occasionally seen in the estuary, a hard night's frost always increasing their numbers, but the great body of them always keep on the lakes and inland waters, and when some of the large flocks come down from their inland haunts to the sea-coast they do not rest with the Wigeon in the estuary, but keep outside Bartragh in the open bay, and, if the weather is stormy, rest on the sands of that island facing the sea. On some mornings hundreds may be seen on their passage from the lakes to the sea, where they remain safe from molestation all day, and after dark they return in little detached parties to their inland feeding grounds. They breed in suitable localities throughout the district, and though an

exceptionally early nest may be discovered, about the middle of May is the time I have found the greatest number of nests with the females sitting.

Gadwall, *Anas strepera*.—This rare duck I have only seen here twice. In the first instance, in the winter of 1855, I observed five birds feeding on the sands at low-water on the Sligo side of the estuary near Scurmore; and again, on the 6th March, 1856, I shot an adult pair (male and female) out of a flock of seven as they were feeding on the Moyview shore in company with some Wigeon. The patch of black on the tail-coverts of the male, and the peculiar carriage of their heads and bills, induced me to aim at them rather than at the Wigeon, of which latter I killed a pair also at the same shot.

Pintail, *Anas acuta*.—Visits the estuary every winter in limited numbers, associating with the Wigeon. Sometimes ten or twelve birds may be seen together, but the general number is seven or eight, probably a little family party.

Teal, *Querquedula crecca*.—Seldom seen in any numbers on the waters of the estuary, unless driven by severe frost from their inland haunts. Flocks of from fifty to a hundred birds may then be seen on the tidal parts of the river, where they remain while the frost lasts; but shortly after the thaw sets in they all return to their favourite feeding grounds by lake and bog. I have seen Teal on Rarooyeen Lake in summer, where they probably have nests amongst the reeds on the margin of the lough.

Wigeon, *Anas penelope*.—Large numbers frequent the estuary and bay, sometimes arriving from their breeding haunts in September. On the 12th of that month, in 1868, I saw fifty near Roserk, and they sometimes delay their departure in spring until April 20th.

Sandwich Tern, *Sterna cantiaca*.—A regular summer visitant to the bay and estuary, generally making its appearance between the last week of March and the middle of April, though I have seen them arrive as early as the 20th March and as late as the 26th April. They breed on the little bog-lake of Rarooyeen. I need not repeat the particulars here, as I have already given a detailed account of their fresh-water breeding haunts in 'The Zoologist' for March of the present year (p. 101).

Common Tern, *Sterna hirundo*.—Common; visiting us regularly every summer, but I have never seen them here before May. They breed on some of the flat islands in Lough Conn.

Arctic Tern, *Sterna arctica*.—I have occasionally shot specimens of this Tern in the estuary and bay during summer, but I have not been able to ascertain whether it breeds in the district.

Lesser Tern, *Sterna minuta*.—Occasionally seen in summer. On the 24th May, 1851, I shot one out of a little flock fishing in the Moyne channel; and in July, 1861, on the sands near Killala, I saw two old birds with a young one. The latter, though able to fly pretty well, had the long feathers of its wings not fully grown up.

Black Tern, *Sterna nigra*.—Very rare, and has only once come under my notice. On the 12th October, 1859, as I was fishing for sea trout near Bartragh I remarked a group of four or five small Terns resting on the sands. I at first took them to be the young of the Common Tern; but shortly after they commenced to hawk after insects, and the very sudden and adroit twists and turns they made in pursuit of their diminutive prey at once showed that they were birds I had never seen before. On shooting a pair I found they were the Black Tern in immature plumage, and it is not improbable that they had been bred on one or other of the bog-lakes of the district.

Black-headed Gull, *Larus ridibundus*.—Resident and breeds in large numbers on several of the lakes of the district. Cloonagh Lake, about two miles from Ballina, is a favourite resort, as also Rarooyeen, the breeding ground of a large colony. In the middle of the little lough there is a small island about fifteen yards in diameter, upon which the nests are placed so thickly that it is almost impossible to walk without damaging either nests or eggs. When I last visited the island I counted upwards of two hundred nests with eggs or young, independently of the numerous nests built amongst the reeds and bulrushes which surround the island and grow on the margin of the lake. In the centre of the island, under a small bush quite in the middle of the gulls, I discovered two wild ducks' nests, containing eight and nine eggs respectively, upon which the ducks were quietly hatching, undisturbed by their noisy neighbours, whose cries were almost deafening while we remained near them.

Kittiwake, *Larus tridactyla*.—Numerous in summer, but only occasionally seen in winter. Thousands breed on the high cliffs of Downpatrick Head.

Common Gull, *Larus canus*.—Very common in winter; a few

occasionally seen in summer. Previously to 1855 a few pairs bred on a little rocky islet in Lough Talt, situated in the Ox Mountains, County Sligo, about ten miles from the sea. I have seen the young birds, scarcely fledged, on the lough, and an old man living close by told me they have always bred there. Since 1855, however, boats have been put on the lake for the use of trout-fishers, and the place has become too much disturbed, especially in May, for the gulls to resort there for breeding.

Herring Gull, *Larus argentatus*.—Resident and common; breeding on the cliffs of Downpatrick Head.

Lesser Black-backed Gull, *Larus fuscus*.—On the contrary, is rare. I have seldom met with it.

Great Black-backed Gull, *Larus marinus*.—Common on the estuary during winter, and ten or twelve pairs nest on the pillar-like rock of Downpatrick Head. This rocky pillar, situated about one hundred yards from the mainland, with deep water between, is about one hundred and fifty feet high, with perpendicular sides, and is quite inaccessible. There are numerous shelf-like ledges along the sides formed by the decay of the softer strata, and on these ledges both species of Cormorants, Guillemots, Razorbills, Herring Gulls, and Kittiwakes rear their young in safety, quite free from molestation by man. The Great Black-backs keep possession of the flat grassy top, and rear their young apart from the ledge-breeding birds. About the end of May this rock and the cliffs of the mainland present one of the most pleasing sights that a lover of nature could wish for. Some few years ago the Great Black-backed Gulls of this locality were nearly exterminated by poison. The tenant of the Bartragh rabbit-warren, being much annoyed by rats, which swarmed in the burrows and destroyed the young rabbits, laid poisoned meat and poisoned rabbits all about the sand-hills. The Gulls, always on the look out for food, devoured this bait greedily, and were afterwards found lying dead in all parts of the island. The following winter I do not remember seeing more than one or two Gulls about the sands; indeed it took several years before their numbers at all came up to what they were before this wholesale poisoning took place.

Iceland Gull, *Larus islandicus*.—Occasionally seen in winter, but not every year. Those met with are generally immature birds, in that cream-coloured garb which I take to be the second year's plumage. I have only once seen it in the adult state, and on

two occasions I think I saw birds in the first year's plumage. On the 4th December, 1851, I shot an immature bird at Bartragh. On the 9th December, 1854, I saw either an Iceland or a Glaucous Gull, but I was too far off to be able to distinguish between the species, although I was able to see quite plainly the white wings which infallibly distinguish the northern gulls. On the 7th May, 1855, a bird in splendid adult plumage flew close by the window where I was sitting at the time, and I had a first-rate view of it. On the 26th January, 1862, I caught on a baited fish-hook a fine young bird that had frequented my ploughed fields for nearly a month, feeding on the worms turned up by the plough. It seemed so tame that I thought it a pity to shoot it, so I attempted to catch it alive for the Zoological Gardens, but it had completely swallowed the hook, and was too much injured by it to live. So, having killed it, I presented it to the Dublin Natural History Society's collection. On the 22nd December of the same year I saw one, on the Enniscrone sands, so very dark in colour as to be evidently a young bird of the year. In 1866, on the 6th January, I shot another young bird in one of my fields, and on the 19th February I saw one at Enniscrone. In 1873, on the 26th January, as I was talking to a friend near Dooneen House, a young bird flew close past us and alighted on the high road about thirty yards off; after looking about for awhile it flew along the road, as if searching for food, for about two hundred yards, and then passed over the adjoining fields. The last time I had the pleasure of seeing one of these northern visitors was on the 28th January of the present year. It was resting amongst a flock of Common and Black-headed Gulls in one of my pasture fields.

Eider Duck, *Anas mollissima*.—An extremely rare visitant. In March, 1870, I observed a pair of immature males near Bartragh, one of which remained about the river and estuary all through the summer and autumn. I shot it near Killanly on the 6th October following. Of this bird I have already given a full account in 'The Zoologist' for February of the present year (p. 50). In December, 1870, my friend Captain Dover obtained a beautiful adult male near Bartragh. Both specimens are now in the Museum of the Royal Dublin Society.

Black Scoter, *Oidemia nigra*.—Very rare. I have only once met with it, in the winter of 1857, when a pair frequented the channel near Bartragh for some weeks.

Pochard, *Fuligula ferina*.—I once shot a solitary female Pochard near Moyview, as it was feeding in the shallow water on the sand, but this is the only one I ever saw in this district.

Scaup, *Fuligula marila*.—Not often seen. I once shot a duck of this species as she was feeding in the channel here, and in January, 1875, I saw two males and a female feeding in the tidal part of the river near Moyfort. Captain Dover, when out punt-shooting, has occasionally seen a few on the river.

Tufted Duck, *Fuligula cristata*.—A winter visitant to the lakes. I have seen it on Lough Conn, but never met with it on the estuary.

Long-tailed Duck, *Harelda glacialis*.—A pretty regular winter visitor to the bay and estuary from 1851 up to 1861. During that period I noted their occurrence every year, except in the years 1853, 1854 and 1860, but the reason of their not appearing during those years in the estuary may have been that they confined themselves altogether to their favourite feeding grounds close to the breakers of the Killala and Moy bars, and did not come into the more accessible parts of the river and estuary, where they would have been more easily observed. During the above-mentioned years they appeared in flocks of from five to fifty; but when they came up the river I only remarked one or two pairs, sometimes only a solitary bird. I have observed them early in October, and once remarked a pair remaining there up to May 6th. On the 31st December, 1861, I shot a fine adult male, and from that time gave up noting their occurrence, for I then came to regard them as regular winter visitors. My friend Captain Dover, who commenced punt-shooting in the estuary in 1868 and has continued to shoot there up to 1876, has only met with this species occasionally, and not every year, during that period. In April, 1875, I saw a pair near Killala, and shot the female, but I have not met with a single bird for the past two winters, although I have closely watched for them in their former favourite feeding grounds. Unless their food has failed in this locality, I cannot account for their desertion of it, as the neighbourhood of their feeding grounds is now much less disturbed than when they regularly visited it.

Goldeneye, *Anas clangula*.—A regular winter visitor, but seldom comes from the inland waters to the tidal parts of the river earlier in the season than February and March, when a few small flocks

may be seen near Belleek demesne and Moyfort, about a mile below the town of Ballina.

Redbreasted Merganser, *Mergus serrator*.—Resident and common, breeding on Lough Conn and other suitable lakes. They sometimes assemble in large flocks on the river near Roserk, and on May 2nd I saw a flock of twenty-four birds close to the shore here, all of which appear to have paired.

Eared Grebe, *Podiceps auritus*.—Very rare. In February, 1852, I saw a pair of Grebes in the Moyne channel, and one which I shot proved to be an Eared Grebe in immature plumage.

Little Grebe, *Podiceps minor*.—Resident and breeds on the little loughs throughout the district. During the winter a little party of five or six birds generally come down to the river and haunt the shores of the islands near Bartragh until March.

Great Northern Diver, *Colymbus glacialis*.—A regular winter visitant. Its favourite haunts are in the bay and estuary, where during winter and spring a few may be always seen. They generally take their departure for their summer quarters about the latter end of April or beginning of May, although sometimes they remain later. Before leaving many assume the summer plumage. On the 24th May, 1851, I had the pleasure of seeing a sight not often witnessed, viz. a flock of ten Northern Divers, nine of which exhibited the beautiful plumage of summer. I met with them in the open bay between Bartragh and Killcummin Head, and they had evidently congregated in preparation for their final departure.

Red-throated Diver, *Colymbus septentrionalis*.—More numerous than the last mentioned. Many assume the breeding plumage before leaving in April and May.

Black-throated Diver, *Colymbus arcticus*.—Very rare. One exhibiting the fine black throat, and apparently in full summer plumage, was seen by my brother, Mr. E. H. Warren, near Bartragh, in April, 1851.

Common Guillemot, *Uria troile*.—Very common, and breeds in large numbers on the cliffs of Downpatrick Head.

Ringed Guillemot, *Uria lachrymans*.—Has been obtained on two occasions. On October 23rd, 1862, I shot one in the channel near here, and on the 23rd April, 1875, I killed a second one in the Moyne channel.

Black Guillemot, *Uria grylle*.—Resident. Breeding in very limited numbers between Kilcummin and Downpatrick Heads.

Little Auk, *Alca alle*.—Has only twice come under my notice. On the 22nd December, 1862, I found four nice specimens thrown up by the surf on the Enniscrone sands, and a fifth on the Moy-view shore. Although dead they were quite fresh and uninjured. Again, on the 17th December, 1863, I found a beautiful specimen thrown up by the surf on the same part of the sands.

Puffin, *Morman fratercula*.—Only met with in winter, and these were dead birds (chiefly young of the year) thrown up by the surf on the Enniscrone sands. On one occasion I found two birds alive, but so thoroughly waterlogged as to be unable to move.

Razorbill, *Alca torda*.—Breeds on the same cliffs as the Guillemots. Occasionally in winter I have found dead birds cast ashore on the Bartragh sands.

Cormorant, *Carbo cormoranus*.—Very common on the estuary and river, extending its fishing excursions also to the inland lakes. It breeds about Downpatrick Head in considerable numbers. When visiting the fresh water they commit great havoc amongst the trout and salmon fry. One shot this spring on the Bunree—a tributary of the Moy—had twelve or fourteen trout in its stomach, one of which was nine inches long.

Green Cormorant, *Carbo cristatus*.—Numerous on the tidal parts of the river and estuary. It appears to be strictly marine in its habits, for I have never seen it either on the lake or upper part of the river. It breeds at Killcummin Head and on other suitable cliffs round the coast.

Gannet, *Sula bassana*.—Often seen during summer in the bay, and probably breeds on the Stags of Broadhaven and other similar islands off the Achill coast. I cannot say with certainty whether it breeds on the Mayo coast, for it is difficult to obtain reliable information. Few persons here take any interest in our sea-birds; and I have had neither time nor opportunity to explore the parts of the coast to which I refer.

Glaucous Gull, *Larus glaucus*.—Has not come under my notice so often as the Iceland Gull, and is of a much more wary and distrustful nature, at least such is my experience. In 1859 I first saw the Glaucous Gull during some snow, on the 14th December, when I came across a fine bird on the shore here, which, although I fired at and severely wounded it, unfortunately got away. In March, 1871, I saw an adult bird on two occasions, but was unable to secure it; and several times during January, 1873, I saw

another (also an adult bird) about the sands and river. At length, on the 23rd of the same month, I shot it near Ballysokeery. It was a fine bird, with some of the dusky colour of the winter plumage about the head and neck. I shot an immature bird in the winter of either 1874 or 1875—I am not certain which, as I did not note it at the time. Again, during the past winter, I several times observed a Glaucous Gull on the river and estuary; and as I was passing the Moyne channel in my punt, on the 28th March last, it flew close by me, and I could not resist the temptation of bringing it down. It proved to be a beautiful adult bird, and the only trace of either winter or immature colours was the angle of the bill being horn-colour.

Pomarine Skua, *Lestrис pomarinus*.—On October 22nd, 1862, I saw several flocks passing to the southward on their autumnal migration, and obtained two birds. Both were nearly adult. As I have already given a detailed account of the occurrence of this and the following species in my notes of the autumnal migration of these two Skuas in 'The Zoologist' for November, 1875, it will be unnecessary to repeat my observations here.

Richardson's Skua, *Lestrис Richardsonii*.—Also seen on their autumnal migration, and specimens obtained at various times.

Long-tailed Skua, *Lestrис Buffonii*.—Has only twice come under my notice. In the first instance, on October 24th, 1862, I fired at a small Skua near Scurmore, but, although badly hit, it got away over the sand-hills. The next day, when walking on the Enniscrone sands, I found a dead Skua, which I brought home, and on skinning it I found gun-shot wounds, which proved it to have been the bird I had wounded the day before. On October 10th, 1867, Mr. N. Handy, of Ballintubber, near Killala, gave me a bird of this species that he had shot on his grouse mountain as it rose from the carcase of a dead horse upon which he said it was feeding. This specimen was nearly adult, but unfortunately had been kept too long, and was unfit for preservation.

Fulmar Petrel, *Procellaria glacialis*.—This bird (so rare on the Irish coast that Thompson mentions only three specimens as having come under his notice) has on several occasions in winter been found on the Enniscrone sands, thrown up by the surf, and occasionally on the sands of other parts of the bay which open to the north. Except in one instance, the birds were dead but quite fresh. On the 24th January, 1857, I found a young Fulmar—

I should say in the first year's plumage—thrown up on the Moy-view shore, the tide having brought it in from the open bay. It was in such good condition that I sent it to my friend Dr. Harvey, of Cork, for his fine collection of native birds. For some days previously to the 24th October, 1862, there was a succession of south and south-westerly gales, but on the night of the 23rd the wind changed to the north and blew very heavily. This induced me to visit Enniscrone on the 24th, to look out for any storm-driven birds that might have come ashore. In the course of my search I found several dead Puffins (both adults and young of the year), and picked up one alive, but so exhausted that it died shortly afterwards. While engaged in examining the Puffin, my attention was attracted by a Great Black-backed Gull dragging and trying to tear something that was lying partly in the water and had just been washed ashore by the surf. On reaching the spot, I picked up an adult Fulmar, in a most wretched condition, completely water-soaked and so utterly worn out as to be unable to stand. It died shortly after I put it into my bag. A few hundred yards farther off I shortly afterwards saw the same gull, at the edge of the water, watching something he apparently feared to attack. I at once hastened to the spot, and found a second Fulmar just come ashore, and in as miserable a state as the first, except that it was not quite so weak, being able to walk a little and to use its powerful beak in self-defence against the attacks of the gull. On November 3rd, 1865, I found another specimen, quite fresh, on the sands of Enniscrone, but unfortunately the gulls had got at it before me and rendered it quite useless as a specimen. On the 3rd October, 1867, I also found a Fulmar cast upon the same part of the shore, and so fresh and uninjured that I sent it to the Dublin Society's Museum; and on the 21st October, 1868, I got another at the same place, which I sent to the Belfast Museum. In 1870, on the 4th March, I found the remains of one destroyed by gulls on the Bartragh sands; and sometime during the winter of 1872 or 1873, I got a fine bird on the Enniscrone sands, which I have now set up for myself. I have no doubt that specimens of the Fulmar would be found every year on the Enniscrone shore, and also of other migratory sea-birds, if a careful search was made during the months of October and November, and up to the middle of December, especially after heavy gales.

Great Shearwater, *Puffinus major*.—Has once come under my notice. When visiting Downpatrick Head with some friends on the 22nd August, 1859, we obtained a dead bird in the brown-mottled plumage of the first year, from a man who had fished it up on the shore a few minutes before we met him. He had some Razorbills and Guillemots which had been washed ashore dead, and we were much amused, when I offered him a few pence for the Shearwater, to hear him recommend us to take the Razorbills in preference, as they were "so much fatter, and better eating!"

Common Shearwater, *Puffinus anglorum*.—Occasionally seen along the coast between Downpatrick Head and the Stags of Broadhaven early in August. I have no doubt they nest on some part of that coast, but I cannot be certain as I never had the opportunity of thoroughly exploring it.

Storm Petrel, *Thalassidroma pelagica*.—Very seldom met with. I have been informed that they breed on some parts of the coast, but have not been able to discover the precise locality.*



ON THE OCCURRENCE OF THE MARSH WARBLER NEAR TAUNTON.

BY THE REV MURRAY A. MATHEW, M.A.

EVER since Mr. Howard Saunders detected the Marsh Warbler, *Acrocephalus palustris*, in the collection of Dr. Woodforde, of Amberd House, near Taunton, and identified the nest and egg preserved with the birds as undoubtedly belonging to that species (*vide* 'Zoologist,' 1875, p. 4713), I have been very anxious to procure more examples in the same neighbourhood, the more so as Professor Newton, exercising a wise caution, has not, with the evidence which was then before him, felt himself justified in admitting the bird into the list of occasional visitants to England. So very closely allied is this aquatic Warbler to the Reed Warbler that it is very difficult indeed to separate skins or

* The scarcity of the Storm Petrel on the Mayo coast, if such is the case, would be rather remarkable, inasmuch as this bird breeds on the coasts and on the islands off the coasts of Donegal, Galway, Clare and Kerry. We can scarcely doubt that it is to be met with, if searched for, on the equally favourable shore line and the numerous islets between Erris Head and Killary Harbour.—ED.

mounted specimens which have been any time dry. The habits, song, nest and eggs of the two birds are widely different, and the observation of these furnishes the best test for discovering the presence of the hitherto reputed scarcer bird. I was sanguine that, if the bird still visited the country near Taunton, I should be able to discover it, as I was able to secure the services of Coates, the birdstuffer, who, some twenty years ago, accompanied Dr. Woodforde when his birds with their nest were taken. Coates was well acquainted with the peculiar song of the male Marsh Warbler, which is very sweet and of considerable power, and also with the bird's more lively habits and more generous display of itself, in comparison with the Reed Warbler, which keeps itself for the most part concealed among rank herbage, where it creeps about like a mouse.

This spring Coates was told to keep a keen watch for the bird, and I am now able to describe the success of his search, which has resulted in the detection of four nests and the capture of one fine adult male Marsh Warbler. The first nest discovered was less than a quarter of a mile distant from the field where Dr. Woodforde's examples had been obtained, and the song of the male bird led to its detection. Accompanied by Coates, Mr. John Marshall, of Belmont, Taunton, went to view this nest *in situ* on the 22nd June last. The place chosen by the birds was a small withy-bed adjoining the turnpike-road connecting Taunton and Milverton, by the side of a small trout-stream, and almost opposite a roadside public-house. The nest was composed externally of dry bents, into which were woven one or two poultry feathers, doubtless obtained from the fowls belonging to the aforesaid hostelry, and very neatly lined with an abundance of horse-hair, gray and brown. It was very compact, of a cup-shape, and was dexterously attached to three stems of *Spiraea* (meadow-sweet), which the birds had drawn together with grass bents, and was about a foot and a half from the ground. It contained four eggs, very different in character from the eggs of the Reed Wren, with a number of which they were compared. These Marsh Warbler's eggs were larger; their ground colour was a creamy white, slightly tinged with green; a few olive blotches were scattered over them, chiefly at the larger ends, where in some of the eggs they formed a dark zone; the pointed ends of the eggs were spotless. An attempt was made, after taking the

nest, to secure the old birds; but they kept themselves hidden in the herbage and among the withies, which formed a thick cover as high as a man's shoulder, and it was not until a long time had been spent in waiting that they showed themselves, and afforded a chance to the gun. Both birds were fired at, and fluttering down among the roots of the tall grass could not be secured; and Mr. Marshall finally left the withy-bed under the idea that the birds had been either killed or wounded; but this did not happen to be the case.

Ten days later Coates again visited the spot and detected the male bird, and after a short search found that the persevering pair had constructed another nest but a few feet from where the first had been placed, and that already an egg had been deposited. On hearing this good news, I waited a few days until the complement of eggs would be laid, and then, early on a beautiful July morning, paid another visit to the withy-bed. A cautious tap dislodged the hen bird from her nest, and by the movements of the tops of the withies I could see where she was creeping off through the cover, and could hear her harsh clacking note. She would not expose herself, and a shot fired where the undulations were noticed was not aimed low enough and failed to secure her. After waiting some time the male bird was suddenly seen perched on a willow overhanging the stream and was brought down. Although the presence of the female was made apparent once or twice subsequently by movements of the herbage, I failed to obtain a chance at her, and went away very contented with the male and the beautiful nest, which now contained four very richly-marked eggs. This second nest was placed exactly as the first had been, and was supported on three stalks of *Spiraea*, which the birds had laced together with dry bents. It was not so closely lined with horse-hair as the first, and altogether less material had been employed by the birds, who doubtless built with great haste with a view to repair the fortunes of their house. No poultry feathers were on the exterior, which was constructed of dry bents only. Still it was a very elegant little nest, exhibiting great ingenuity, and when cut from its position with the three rods of *Spiraea* laden on the top, with the sweet-scented white blossoms, it made a charming picture.

At the same time that Coates had reported his discovery of the first nest, he also announced the fact that another pair of Marsh

Warblers frequented a ballast-pit not far from the Tone, and close to the Great Western Railway, about a mile to the east of Taunton. When this spot was visited, a little search resulted in the discovery of the nest, which then contained four eggs. I was anxious that these should be hatched off, in order that Coates might be able to snare the old birds and the young. He was therefore directed to keep careful watch upon it, and after another visit he returned to say that one young bird had been hatched, and that the other three eggs appeared addled, and that a pair of Red-backed Shrikes were in dangerous proximity to the nest. Mr. Marshall therefore had one of the addled eggs taken from the nest, which precisely resembled the eggs I have described above, and appointed a morning for Coates to attempt to snare the old birds. Unfortunately, when this morning arrived, it was discovered that some birds-nesting boys had been beforehand; the herbage was trampled down in all directions, and the precious nest had disappeared.

We were, however, consoled for this misfortune by hearing the next day that Coates had discovered that the other pair of Marsh Warblers had built a second nest. The small withy-bed which was selected for it appears to be a favourite resort for birds. It is barely the eighth of an acre in extent, yet besides the Marsh Warblers it gave shelter to a pair of common Whitethroats and their nest, a pair of Sedge-birds and nest, a pair of Bullfinches and their brood; and high up in a hazel-bush overhanging the stream a dome-shaped nest was found, which on examination proved to be built of hay, in the form of a perfect dome, with a small hole for ingress, and contained three freshly-laid eggs of the House Sparrow. We all agreed that it was a very unusual site for a Sparrow's nest, and a singularly neat nest for the bird. While watching for the Marsh Warblers, a Lesser Spotted Wood-pecker suddenly rose from the willows by the stream and almost flew in our faces, and there were numerous Chiffchaffs and Willow Wrens all round us, and doubtless many other nests in the little cover besides those we detected. The male Marsh Warbler captured is a very perfect specimen, and when picked up its breast was suffused with a delicate primrose-yellow, a tint which proved extremely evanescent, and had almost disappeared before the bird was completely cold. We took careful notes of the coloration of the soft parts directly the bird was in our hands, and observed that

the upper mandible was a pale horn-colour, the lower mandible primrose-yellow; inside of rictus bright yellow; eyes dark violet, with dark brown irides; legs pale flesh-colour, tinged with brown; soles of feet extremely bright primrose-yellow (this singular characteristic pertains also to the Reed Warbler); claws pale flesh-colour, tinged beneath with yellow.

Mr. Dresser's test of the comparative length of the primaries held good, the second primary being found conspicuously longer than the fourth. I do not think much of this mark of distinction, for on looking at two fine adults of what I have always considered the Reed Warbler,—one shot near Cambridge, the other taken at the spring migration near Brighton,—I find that in both the second primary is much longer than the fourth. It is just possible that both these birds may be *A. palustris*, for they certainly have backs more of an olive-brown than of a russet-brown; and this is Mr. Howard Saunders' differentiation of the two species. In general coloration the Marsh Warbler and the Reed Warbler are, as I have said, almost identical, and perhaps the shades of colour on the upper parts furnish the only point of distinction between them, and even these shades approach one another very closely as the skins dry and the general tone of colour fades and approximates to what a witty friend of Mr. Dresser well termed "museum colour."

I may add to this account the statement of Coates, that during his experience as a bird-catcher in the environs of Taunton, he has at different times taken more than a dozen nests similar to those described above, and with eggs in them of the same character. Mr. Marshall, however, thinks that he can have taken none during the last thirteen years, or they would have been brought to him, and possibly this statement of the birdcatcher may be an exaggeration.

Since writing the above, Mr. Howard Saunders has kindly lent me a beautiful skin of a male *A. palustris*, labelled "Astrachan," to compare with my Taunton bird; and although this specimen is in perfect plumage, and mine is rather ragged from moult having set in, after placing the two side by side, I can only detect a perfect resemblance. The olive tints of the back are the same, and so are the white under parts, on which a delicate primrose tinge is still more or less apparent; and in both birds the second

primary is the longest in the wing. In 'Our Summer Migrants' (p. 98), I see Mr. Harting says that in *A. palustris* the tarsi when dry are of a yellowish brown, while those of *A. strepera* become hair-brown. In Mr. Saunders' skin the tarsi are, as Mr. Harting describes, yellowish; whereas in my mounted specimen the legs are now as dark as those of a Chiffchaff, the reason for this being the dark-coloured iron wires which are visible through the thin membranes. When my bird was fresh, the legs, as stated above, were pale flesh-colour, slightly tinged with primrose.

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OCCASIONAL NOTES.

MARTENS IN SUFFOLK.—The following communication from Mr. J. H. Gurney, published in the 'Transactions of the Norfolk and Norwich Naturalists' Society' (vol. ii. pp. 223-4), may be of interest to your readers, as it shows that less than seventy years ago Marten-eats were found in considerable numbers in the county of Suffolk. The large number of Rats destroyed is also worthy of note; it is evident they received from the gamekeepers the attention they deserve, whereas now their natural enemies are assiduously destroyed, but the Rats, secure in the quiet of the covert, increase to an enormous extent, and many an empty nest is the result. Mr. Gurney says:—"I have a cutting from a newspaper of the year 1811, by which it appears that at the Suffolk Gamekeepers' Annual Meeting, held at Bury on December 9th of that year, a prize was given to one Sharnton as the most successful gamekeeper. He had the looking over (with two under-keepers) of 4000 acres, but in what parishes the manor lay is not stated; evidently, however, it was in Suffolk. Sharnton gave in an account of vermin destroyed by him and his assistants in twelve months, which I think may be worthy of a place in the records of our Naturalists' Society, as bearing on the existence of the Marten in Suffolk, sixty-five years ago. His account is as follows:—Foxes, 22; Martens (spelled 'Martins'), 43; Polecats, 31; Stoats, 416; Crows and Magpies, 120; Hawks of all kinds, 167; Field Rats, 310; Brown Owls, 13; Wild Cats, 7."—T. SOUTHWELL (Norwich).

REPORTED OCCURRENCE OF THE WILD CAT IN THE ISLE OF WIGHT.—A veritable Wild Cat, probably the last of the race, was shot some months since near St. Helen's, in which neighbourhood there are still extensive woods, chiefly on the Nunwell Estate. Though occasionally seen by the gamekeepers, it had managed to evade them for years. It came into Mr. Careless's possession the day it was killed. It proved to be a male, three feet in length and nine pounds fourteen ounces in weight. It stands

high on the legs—namely, about fourteen inches—and is a very formidable looking animal, with powerful jaws. The distribution of colours is very similar to those of the Inverness specimen described in ‘The Zoologist’ (2nd ser. p. 4791), but this cat is darker, and seemingly more aged. How it could have escaped for so many years is wonderful.—HENRY HADFIELD (Ventnor, Isle of Wight).

[We are extremely sceptical in regard to the alleged existence of Wild Cats in the South of England at the present day, and, notwithstanding the colour and large size of many of the animals killed, we cannot help regarding them as of hearth-rug ancestry. We should like to know what our readers in the New Forest have to say on the subject.—ED.]

PURPLE GALLINULE IN SOMERSETSHIRE.—On visiting the British Museum, a few days since, I carefully looked at the different species of *Porphyrio* in the National Collection, the result being that I satisfied myself that my Irish example is not the small *Porphyrio Martiniquii*, but the South European *P. veterum*. I have read Mr. Smith’s remarks on the specimen of this *Porphyrio* obtained in Somersetshire, and as he objects to regard it as a straggler to this country, he is bound to bear the *onus probandi*, and to bring forward something more than a mere surmise that it is only a bird that has escaped from confinement. Unless, as I have already remarked, there is something altogether exceptional in the bird which is met with at large, it is, in the absence of proof to the contrary, fairly entitled to be ranked as a voluntary straggler to this country. The facilities of importation which exist at the present time, which are rendering this country what Pericles claimed Athens to be, the emporium of the whole world, and that, so far as concerns living specimens of foreign animals as well as the ordinary spoils of merchandize, must not be stretched too far to account for every unusual bird found wild in our woods and fields. To do this is greatly to destroy the romance of British Ornithology. The attitude of the ornithologist in this country should be one of general expectation. From the situation of this island, it offers a natural resting-place to birds which may have lost their reckoning in their migrations both from the Old and the New World. To pronounce, then, of any new-comer to the British list that “it is only an escape” is to cast a damper upon this expectant feeling, and to abandon the peculiar fortune with which the position of this country has enriched its naturalists. It is for this reason, chiefly, that I decline to retire from my defence of the Somersetshire Purple Gallinule, and to ask Mr. Smith to furnish proofs that the specimen in question escaped from an aviary. Does he know of any one who, residing not far from the locality of its capture, happened about that time to lose so rare a bird? Even if he did, I might enquire for certain marks of confinement which all birds, however handsomely treated in the aviary, are almost sure to exhibit; dull, soiled, or abraded plumage; less brilliancy in the coloration of the softer

parts, the skin of the bill and legs—and here we have a never-absent sign of a bird which has been for any length of time deprived of its freedom; and if none of these could be pointed out in the captured specimen, I should then, in spite of one having been known to have strayed from an aviary somewhere at hand, feel as much entitled to my assumption that this bird, which showed no traces of its captivity, must be another, and *not* the escaped one, as an objector would be justified in claiming it as the missing bird. I see that Mr. Dresser, after mentioning two examples of the Purple Gallinule which had been obtained in the North of England, adds that these were probably escapes, and his decision justly carries great weight; but Mr. Gray, who was fortunate enough to handle, in the flesh, one which had been shot in Argyleshire, could find on the bird no signs that it had ever been subjected to confinement. Bearing in mind that these birds are migratory, and that the mouth of the Rhone or the coast of Portugal is at no great distance from this country for a bird when fairly on wing, *Porphyrio veterum* might justly object to be refused a place among the list of our chance visitors, which includes many other birds even less likely than this to wander to our coasts.—MURRAY A. MATHEW (Bishop's Lydeard, Taunton).

THE MIGRATION OF BIRDS.—I have read the remarks of Mr. Cordeaux in 'The Zoologist' for May (p. 205), on the subject of migration, and am almost tempted to reply. I cannot afford the time, however, even if you would grant me the space. I will only observe that there are apparently three classes of thinkers. First, those who believe in "an intuitive instinct which almost seems like a sixth sense," of which number Mr. Cordeaux is one. Secondly, those who vote avine migration—and with it, I suppose, all migration—to be a mystery. Thirdly, persons, of whom I am one, not able to understand "the sixth sense," not finding any great mystery, but regarding avine migration as part of the general law of flux and reflux which is apparent in so many organisms, &c., in the orb in which we dwell, and which is one of the conditions of the Universe. I may remark, however, that I do not go the full length attributed to me by Mr. Cordeaux, for to deny *any* instinct to animals would no doubt be "absurd." I only say these few words for fear silence might be thought discourteous towards a gentleman who has worked at this subject for "more than twenty years," in fact, almost as long as I have.—GEORGE DAWSON ROWLEY (Chichester House, Brighton).

CUCKOO'S EGG IN A BLACKBIRD'S NEST.—Whilst looking for Reed Warblers' nests on the Thames this summer I found a Cuckoo's egg in a Blackbird's nest, which was built in willows overhanging the river. A few yards further on I found another egg in a Reed Warbler's nest, agreeing with the first in colour, &c., and evidently laid by the same bird. Although this is not the first instance that has been known of a Cuckoo placing its

egg in a Blackbird's nest (see Yarrell's 'British Birds'), I think it is of sufficiently rare occurrence to be recorded. The notice of a Cuckoo's egg in a Swallow's nest in 'The Zoologist' for June (p. 260) is very interesting, and although it is the first time the egg has been found in the nest of this species, yet as in 'The Zoologist' for 1869 (p. 1866) a description was given of a young Cuckoo falling out of a Swallow's nest, it is to be presumed that the egg must have been previously laid there. If any of your readers know of an instance of a Cuckoo's egg being found in the nest of the Twite, Goldfinch, or Lesser Redpoll, I shall esteem it a favour if he will send me the particulars.—EDWARD BIDWELL (7, Ormond Terrace, Richmond).

[In the account referred to ('Zoologist,' 1869, p. 1866), no evidence is adduced to prove that the young Cuckoo was ever in the Swallow's nest. The statement to that effect is purely inferential. It is just as probable that the bird may have been hatched in the neighbouring nest of a Water Wagtail, and on perching on a chimney top in one of its early flights may have overbalanced itself and tumbled down.—ED.]

CUCKOO EVICTING YOUNG HEDGESPARROWS.—A Hedgesparrow hatched in May four young ones in a thick bush of *Arbor Vitæ* by my drawing-room window. One afternoon I saw a Cuckoo fly down right into the middle of the bush, and a great scuffle ensued. I ran up and found the nest empty, and all four young birds on the ground. I replaced them in the nest, and thought I had frightened away my Hedgesparrows' enemy for good. However, three days after I looked at my nest on returning from London, and found the four young birds on the ground. They were stiff, and I thought dying, but I replaced them as before. Under their mother's warm feathers three of them recovered; one died. A day or two after I found on my return from London all the birds again on the ground quite dead. They had evidently been out of their nest some hours. I have not a doubt that on each of the last two occasions the Cuckoo was the culprit, but she (if it was a she) never laid an egg, and the only just verdict I can think of is "malice prepense."—J. H. BUXTON (Nunsbury, Hoddesdon).

THE COLLARED DUCK, *Fuligula collaris* (Donovan).—When at Liverpool, in April, 1876, I was informed by Mr. T. J. Moore that he had recently met with three ducks of the above species in St. John's Market. This is a capital market for rarities. On a former visit I found a Nyroca, or White-eyed Pochard, there among a row of Tufted Ducks. In the present case there was no doubt of the Collared Ducks having been imported from America; but the species was met with in Leadenhall Market, London, so long ago as January, 1801, by Donovan (who seems to have been the first describer of it), and why it was excluded from the British list by Yarrell I do not know. The American Wigeon, which was also obtained in Leadenhall Market, was admitted on the ground that it was found here

before it became the custom to import American wild fowl, and the same argument would apply even more strongly to the Collared Duck of Donovan. If English naturalists have not admitted it, however, the French have done so for them. In Degland and Gerbe's 'Ornithologie Européenne,' it is included (No. 495), and readers are informed that it has been observed several times in Great Britain. Stories lose nothing in crossing the channel! Its habitat is thus given in Coues' 'Birds of the North-West' (p. 574):—"Hab. The whole of North America, breeding far north, wintering in the United States and beyond. South to Guatemala. Cuba. Jamaica."—J. H. GURNEY, JUN. (Northrepps Cottage, Norwich).

POCHARDS BREEDING IN THE REGENT'S PARK.—For the last two months I have noticed a pair of Pochards on the ornamental water in the Regent's Park; and feeling certain that they had nested there, I went to look for them on June 28th, and found they had hatched out five young ones. The latter swim and dive like the old ones.—G. ATKINS (21, Park Village East).

[We also have had an eye on these Pochards, and observed the young for the first time on Saturday, June 23rd. They were then swimming with their mother and seemed to be not more than a day or two old. The male parent did not appear, and it is therefore not quite certain yet whether the young are pure-bred Pochards or hybrids.—ED.]

TAWNY PIPIT IN SUSSEX.—I am able to add another unrecorded Tawny Pipit from Sussex, which is also an immature bird, in the plumage described by Mr. Bond (p. 299). This example was shot at Ditchling Bostel, on the 29th September, 1876, as I was informed by Mr. Pratt, of Brighton, from whom I obtained it. There is a great superficial resemblance between the Tawny and Richard's Pipits. The Tawny might well pass for a small example of *Anthus Richardi*. Both have long tarsi, and pretty much the same coloured plumage. I was struck by the resemblance when examining Mr. Vingoe's Penzance specimen last summer, which, if I remember rightly, was also a bird of the year.—MURRAY A. MATHEW (Bishop's Lydeard).

UNUSUAL SITE FOR A KESTREL'S NEST.—A Kestrel laid this summer in a hen-roost in a long sheep-trough, and hatched four young ones. Whilst sitting (in May) a day's sheep-shearing was carried on, from 6 A. M. till 8 P. M., but did not disturb the bird, although quite close to her. The young ones are now seventeen days old. I can see them every day from a stage in the barn, and it is most amusing to me to observe their domestic arrangements. At first the young were treated with the brains of young Plovers, but now they get moles, mice, and young birds. The lady rules the roast, and when both the old birds come together with food, she manages to convince her mate that a mole is better than a young blackbird.—FREDERICK STRATTON (St. Joan-a-Gore, Devizes).

PIED FLYCATCHER AND OTHER BIRDS IN THE ISLE OF WIGHT.—On the 30th April, when at Sea View, I was asked to identify a strange bird shot in the neighbourhood on the 28th. It proved to be a male Pied Flycatcher, in perfect plumage. This species is of rare occurrence here. Yarrell refers to a specimen shot in the island, and I believe one was killed near Freshwater a few years since. I was shown a Thick-kneed Plover, shot in the island on March 12th, 1876. Mr. Careless has had the following birds brought to him in the flesh, all killed in the island:—Crossbill (in January), Black-throated Diver (during the winter), Velvet Scoter, Great Black-backed Gull, Fulmar Petrel, Crested Lark, Short-eared Owl, Sheldrake, Lesser Spotted Woodpecker (a rare visitant), also a Hooded Crow—seldom met with in the island.—HENRY HADFIELD (Ventnor, Isle of Wight).

[We should like to know something more about the Crested Lark. When, where, and by whom shot, and by whom identified? We have seen many a Sky Lark with a good crest fondly regarded by its owner as a veritable Crested Lark.—ED.]

SINGULAR VARIETY OF THE HOUSE MARTIN.—I have lately obtained from a birdstuffer at Worthing, in this county, a very beautiful variety of the House Martin, the whole of the quills of the wings and the bastard wings being of a pure white, while the rest of the plumage is of the usual colour. It is a bird of the year, and was shot near Worthing in the autumn of last year.—WILLIAM BORRER (Cowfold, Sussex).

SPOONBILLS IN SUFFOLK IN JUNE.—During the early part of June a flock of nine Spoonbills frequented the marshes adjoining the coast near Aldborough, and to the credit of the resident gunners,—who, I am glad to say, respect the Wild Fowl Protection Act,—they were allowed to remain unmolested. It is to be hoped that continued protection may beget sufficient confidence in these beautiful birds to induce them again to take up their quarters, as of old, in this country during the breeding season.—F. KERRY (Harwich).

SPOONBILL NEAR ELY.—A spoonbill has been seen in the neighbourhood of Ely for some days, but has now (July 9th) departed. I am glad to say it escaped the snare of the fowler.—H. M. UPCHER (Feltwell).

WINGS AGAINST STEAM.—On July 13th there was a race from Dover to London between the continental mail express train and a carrier pigeon conveying a document of an urgent nature from the French police. The pigeon, which was bred by Messrs. Hartley and Sons, of Woolwich, and “homed” when a few weeks old to a building in Cannon-street, City, was of the best breed of homing pigeons, known as “Belgian voyageurs.” The bird was tossed through the railway carriage window by a French official as the train moved from the Admiralty Pier, the wind being west and the atmosphere hazy, but with the sun shining. For upwards of a minute the

carrier pigeon circled round to an altitude of about half a mile, and then sailed away towards London. By this time the train, which carried the European mails, and was timed not to stop between Dover and Cannon-street, had got up to full speed, and was proceeding at the rate of sixty miles an hour towards London. The odds at starting seemed against the bird, and the railway officials predicted that the little messenger would be beaten in the race. The pigeon, however, as soon as it ascertained its bearings, took the nearest homeward route in a direction midway between Maidstone and Sittingbourne, the distance, "as the crow flies," between Dover and London being 70 miles, and by rail $76\frac{1}{2}$ miles. When the Continental mail express came into Cannon-street Station, the bird had been home 20 minutes, having beaten Her Majesty's Royal Mail by a time allowance representing 18 miles.—*From 'The Times,' July 14th.*

RARE BRITISH FISHES OFF BABBICOMBE.—One of the rarest of British fishes—the Black-fish, *Centrolophus pomphilus*—was taken this morning (June 15th) off Babbicombe, by Mr. Gaskin, of that place. It is curious that the seine inclosed at the same time another fish of great rarity, the Short Sun-fish, *Orthagoriscus mola*. Both were submitted to me for identification.—P. H. GOSSE (Sandhurst, Torquay).

[The Black-fish is figured in Couch's 'Fishes of the British Islands' (vol. ii. p. 123, pl. xc.), and all the specimens mentioned by that author seem to have been met with in Cornwall. He states, however, on the authority of Mr. Joshua Alder, that an example has been taken at Cullercoats. The Short Sun-fish will also be found figured in the same work (vol. iv. p. 377, pl. ccxlv.). This strange-looking fish is generally spoken of as rare, but on the south and west coasts can scarcely be considered so, for hardly a year passes without the capture of a few being reported. They are generally taken during the warmer months of the year.—ED.]

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

June 7, 1877.—Prof. ALLMANN, F.R.S., President, in the chair.

The first zoological paper read was by Mr. Robert M'Lachlan, *viz.*, "On the Nymph Stage of the *Embidae*, with Notes on the Habits of the Family, &c." The author stated that in 1837 Prof. Westwood (in *Trans. Linn. Soc.*) instituted the characters of *Embia*, a genus of insects allied to the white ant. Lately, therefore forty years after, Mr. Michael discovered some orchids partially destroyed by an insect found to belong to the *Embidae*; and the nymph stage obtained fills a gap in its history. Mr. M'Lachlan, in allusion to the insect's habits, states that M. Lucas and

others mention its being carnivorous, and spinning a silken web like that of a spider, but which he believes to be for protection from its enemies, while he doubts its carnivorous habits, regarding it as probably a vegetable feeder. He then entered into the subject of systematic position, structure, distribution, number of species, concluding with a detailed description and zoological remarks on those now known. He observed that the larva of a species of *Embia* has been noticed in fossil amber. The living forms inhabit both hemispheres at spots wide apart. None are known from Australia.

Mr. G. Busk verbally explained the more important points in the succeeding paper, *viz.*, "Observations on British Polyzoa," by the worthy field-naturalist, Mr. C. Peach. The latter has faithfully described and delineated a number of forms of this marine family, some of which he considers as new to science, and of other known genera and species he adds much information regarding their habits and history. For instance, *Scrupocellaria seruposa* he finds has tubulous wool-fibre-like roots, armed with spines, by which it attaches itself to certain sponges, &c., a fact which appears to have been overlooked in all works on British Zoophytes, though Mr. Busk, in his 'Catalogue of Marine Polyzoa,' has adverted to *S. Macandrei* from the coast of Spain and *S. ferox* from Bass' Straits as possessing "radical tubes hooked." *Eschara stellata* and *Discopora meandrina*, both dredged by Mr. Gwyn Jeffreys off Shetland in 1864, Mr. Peach considers as new species.

A short, partly descriptive, paper by Mr. Edward J. Miers, "On Species of Crustacea living within the Venus' Flower-basket (*Euplectella*) and in *Meyerina claviformis*," was laid before the meeting. Among the late Dr. J. S. Bowerbank's collection of Sponges recently acquired by the British Museum authorities was a bottle containing Crustacea from within *Alcyonellum speciosum*, from Zebu, Philippines, ninety-five fathoms. The existence of Crustacea within some of the vitreous sponges has been long known; nevertheless a technical account of the species so imprisoned has been hitherto somewhat defective. Mr. Miers' account of *Spongicola venusta*, De Haan, of *Æga spongiophila*, Semper, and of *Cirolana multidigitata* supply this want.

Several interesting botanical papers were read and discussed, *viz.*, Dr. Maxwell Masters, "On the Morphology of Primroses;" the Rev. G. Henslow, "Note on the Numerical Increase of Parts of Plants;" Mr. Marcus Hartog, "On the Floral Development and Symmetry in the Order Sapotaceæ;" and "A Notice of the Lichens of the 'Challenger' Expedition," by the Rev. J. M. Crombie.

June 21, 1877.—The Rev. G. HENSLOW, M.A., F.L.S., in the chair.

Dr. John McDonald, Gothic House, Walton-on-Thames, Surrey, was duly elected a Fellow of the Society.

Mr. P. Herbert Carpenter, B.A., orally demonstrated from diagrams the gist of a well-illustrated memoir by him, "On the Genus *Actinometra* (Müll.), with a Morphological Account of a new Species from the Philippine Islands." In his MS. the author shows the impossibility of adhering to Müller's classification of the *Comatulæ*, according to the number of the ambulacra which radiate from the peristone, and the necessity of extending the limits of Müller's genus *Actinometra*, so as to include all those forms of *Alecto*, in which the mouth is eccentric, and which have no place in the genus *Antedon* as defined by Mr. Norman. Another feature of many *Actinometra* is the complete closure of the ambulacral grooves on more or fewer of the posterior or aboral arms, and the entire absence from such arms of a ventral ciliated epithelium, and of the so-called ambulacral nerve beneath it. The rosette of *Actinometra* presents a more embryonic condition than that of *Antedon*, the primitive basals undergoing a less complete metamorphosis; but it is closely ankylosed to fine prismatic pieces, which result from more or less complete ossification round the connective tissue-fibres of the synostosis between the centro-dorsal piece and radial pentagon. These pieces, traces of which also occur in *Antedon Eschrichtii* are closely similar to the fine basals of *Solanocrinus costatus* of the Wurtemburg Jurakalk, except in the fact that they do not as in *Solanocrinus* appear on the exterior of the calyx.

In the absence of the author, the Secretary shortly referred to a "Description of Genera and Species of Australian Phytophagous Beetles," by Dr. Joseph S. Baly. In this communication fourteen species, in all, of the genera *Triocophala*, *Rhombostromus*, *Bucharis*, *Polyachus* and *Ditiopidus* are treated of.

The title only of Mr. R. Bowdler Sharpe's third part of his "Contributions to the Ornithology of New Guinea" was announced, the author himself not being present.

This was followed by Dr. W. C. M'Intosh's paper, "On the *Annelida* obtained during the Cruise of H.M.S. 'Valorous' to Davis Strait in 1875." The specimens were collected by Dr. Gwyn Jeffreys, though barely in such good condition as those received from the 'Porcupine' and 'Osprey' Expeditions. Since the days of Fabricius, the Annelids of the Greenlandic Seas have received unusual attention in comparison with those of other parts, Ørsted, Malmgren, Otto Zorell, Lüthen and others having added considerably to the number known. Though, by an unfortunate circumstance, the dredging received a check, and limited the species of marine *Polychata* to about sixty-eight, yet of this comparatively small number thirteen are new to the Greenlandic area, and in addition nine are new to science. As far as at present can be judged by the Annelids, Dr. Jeffreys' opinion, that the Greenlandic Invertebrates are more European than American, is substantiated. Dr. M'Intosh describes in detail the various

species and genera obtained, and gives good drawings of the anatomy of some of the new and most remarkable forms. He also adds a useful note concerning the best method of preserving these soft and delicate creatures.

The abstract of a "Monograph of the Gymnozoidal Discostomatous Flagellata, with a new Scheme of Classification of the *Protozoa*," by Mr. W. Saville-Kent, was read by the Secretary. In this communication the writer places on record the results of his extended investigations among that remarkable "collar-bearing" group of the flagellate *Infusoria* first introduced to scientific notice by the late Prof. H. J. Clark of Pennsylvania, in 1868. By Mr. Kent's researches, the group is now made to embrace no less than eight well-marked genera and about forty species, in place of the two genera and four species first introduced by Prof. Clark. The majority of the members of this group are sedentary in their habits, being attached in a sessile manner by a pedicle to aquatic objects. Compound colonies are frequently produced, rivalling in luxuriance, &c., colony stalks of *Epistylis*, &c., among higher ciliate *Infusoria*. Some are characterized by inhabiting transparent Coricæ, after the manner of *Vaginicola*, and others rove freely through the water. All are of such minute size as to require a magnifying power of at least 500 diameters for their investigation, and possibly to this circumstance they may so long have escaped the attention of observers. The chief significance that attaches to the collar-bearing group in question is the circumstance, first recognized by Prof. J. Clark, that similar animalcules constitute the fundamental basis and the essential living units of all known Sponges. This identity of structure, confirmed by the investigations of Mr. Carter, has been followed up in Mr. Kent's memoir, and is held by him to be subversive of Prof. Haeckel's theory as to the cœlenterate nature of Sponges. Mr. Kent further submits a proposition for a new classification of the subkingdom *Protozoa*, which he divides into four leading natural groups of equal value, the distinctive features of which are afforded by the characters of the oral or interruptive area. These Protozoan groups are termed by him, (1) *Olostomata*, (2) *Polystomata*, (3) *Discostomatæ*, and (4) *Monostomata*.

Another paper, which may be considered as appertaining to a zoological moot subject, was read by Prof. Charlton Bastian, *viz.*, "On the Conditions favouring Fermentation and the Appearances of *Bacteria*." In this the author puts his matter in a fourfold aspect:—1. He makes known in detail certain experimental conditions which he has found to be highly favourable to the occurrence of fermentation in boiled fluids. 2. He records fresh instances of the occurrence of fermentation in boiled acid fluids, which according to M. Pasteur invariably remain barren. 3. He brings forward certain crucial evidence upon the disputed interpretation of the fertility of boiled neutral or faintly alkaline fluids. 4. He adduces further instances of fermentation of fluids heated to 280° Fahr. and upwards.

The botanical contributions read in full or abstract at this meeting were as follows:—"Fungi of the Counties of Dublin and Wicklow," by Mr. Greenwood Pim; "Notes on the Peculiarities and Distribution of the *Rubiaceæ* of Tropical Africa," by Mr. P. Hiern; "Note on the Automatic Movement of the Leaves of the Climbing of India, *Anerrhoa Blimbi* (L.)," by Mr. R. I. Lynch; and a highly interesting memoir, by Dr. D. Cunningham, "On *Mycoides parasitica*, a new genus of *Algaæ*, and the part it plays in the formation of certain Lichens."

With a few parting remarks from the Chairman, the session closed.—
JAMES MURIE, *Secretary.*

ENTOMOLOGICAL SOCIETY OF LONDON.

July 4, 1877.—Professor J. O. WESTWOOD, M.A., F.L.S., President, in the chair.

The minutes of the previous meeting were read and confirmed.

Donations to the Library were announced and thanks voted to the donors.

Mr. J. W. Douglas exhibited a living specimen of *Cerambyx Heros* bred from a log of wood imported from Bosnia; also a young larva of the same species from the same source.

Prof. Westwood exhibited a number of cases constructed by the larva of some species of *Phryganæa* inhabiting Southern Europe. They were composed of small semi-transparent quartz-like particles, and had been described by Swainson in 1840 as a shell belonging to the genus *Thelidomus*, div. *Turbineæ*.

Prof. Westwood also exhibited a specimen of a plant-bug (*Capsidæ*) which had been sent to him by Mr. Alexander Wallace, together with the leaf of an orchis (*Cattleya Acclande*), from Bahia. The leaf was covered all over with blisters caused by the attacks of the insect.

Mr. Jenner Weir exhibited a female specimen of *Cicada montana*, taken in his presence in the New Forest by Mr. Henry Auld, who stated that he was attracted to the spot where the insect was concealed by hearing it stridulate.

Mr. J. W. Douglas suggested that possibly the specimen caught did not give rise to the sound heard, but that it was produced by a male concealed near.

Mr. Weir remarked that he had searched for the stridulating organ in the specimen exhibited, and had found traces, although developed but slightly in comparison with those of the male.

Mr. S. Stevens exhibited two living specimens of *Tillus unifasciatus*, taken near Norwood. They fly rapidly in the sunshine, and settle on oak-palings.

Mr. J. P. Mansell Weale read notes "On Variations in Rhopalocerous forms inhabiting South Africa." The author, after stating that he had travelled over most of the eastern districts of the Cape Colony, alluded to the distribution of plants as affecting that of insects, and noticed the apparent encroachments of the subtropical flora and insect fauna along the south-eastern seaboard, the absence of any great barriers and the general uniformity tending to produce close variations. He exhibited and remarked on a large series of *Papilio merope*, male and female, some reared by him, and all collected in one small wooded gully, isolated in an open grass country. He also exhibited male and female *Nymphalis xiphares* (*Thyestes*), the male of which is wanting in the National Collection, remarking on the apparent imitation by the female of *Amuris Echeria*. He next exhibited and remarked on a series of imagines of *Aeræa Esetria*, some of the forms of which are separated by some entomologists, and stated that all the forms had been reared from larvæ collected on a single plant. He next exhibited a series of *Innonia Pelasgis* and *Archesia*, showing a very close gradation linking the two forms, and showed that some of the latter approached *I. Amestris*, although the alliance was not so evident as in *I. Pelasgis*. He objected to the use of the name "species" as too freely used among plants and insects, and suggested that it merely implied a provisionally uncertain distinction of apparently important differences. In illustration of this, he exhibited specimens of *Callosine Evarne* and *Keiskamma*, two forms hitherto held distinct, but of which the ova, larvæ and pupæ exhibited no differences, although in two broods in successive years the forms appeared separately. He also remarked on artificially produced changes in the pupæ.

Prof. Westwood stated that he had just received collections of Coleoptera and Lepidoptera from South Africa, collected by Mr. Oates.

The Secretary read a letter from Mr. W. G. Gibson, of Dumfries, stating that *Colias Edusa* had made its appearance in that district during the month of June, and suggesting that its occurrence might be accounted for by the large importation of foreign clover.

Prof. Westwood stated that Mr. Alexander Wallace had informed him that both *Colias Edusa* and *Hyale* were very common about Colchester in June.

Prof. Westwood brought under the Society's notice the recent accounts of the appearance of the Colorado beetle in Ontario and near Cologne.

Mr. May handed in a copy of the Memorandum issued by the Canadian Minister of Agriculture in relation to this insect.

Part II. of the 'Transactions' for 1877 was on the table.—R. MELDOLA,
Hon. Sec.

NOTICES OF NEW BOOKS.

The Birds of South Africa. By E. L. LAYARD, F.Z.S., &c.
A New Edition, thoroughly revised and augmented by
R. B. SHARPE, F.L.S., F.Z.S. Royal 8vo. Parts I.—IV.
London : Quaritch. 1877.

THE best way of reviewing a new edition is obviously to compare it with the original. In the present case, however, this would scarcely be fair, for a glance only is needed to show that the editor has nearly doubled the size of the work by extending the boundaries of the region treated of, from the twenty-eighth parallel of latitude (the limit originally fixed by the author) to the Zambesi on the east coast, and the Quanza on the west coast of Africa. It should be remembered also that when Mr. Layard wrote his book, in 1867, he did so under great disadvantages. Far removed from European libraries and collections, he was prevented from making many references and comparisons that were most desirable, and in many cases he had to rely upon naturalists at home for the identification of the rarer and more obscure species. In view of these difficulties, the wonder is that his shortcomings have proved to be so few. It may be truly said that, with the exception perhaps of Jerdon's 'Birds of India,' no work has done more for the Ornithology of a country than this of Mr. Layard's, and no greater proof of its utility can be found than the large increase in the number of workers who have commenced original researches in Ornithology since it appeared.

In preparing this new edition, it is evident that Mr. Sharpe has bestowed upon it considerable time and trouble. Not content with revising the text so as to bring it to a level with the knowledge of the present day, he has carefully gone through all the works bearing on the subject published prior to the first edition, and has reproduced the excellent notes by Mr. Ayres on the birds of Natal which Mr. Layard for want of space was compelled to omit.

Especial pains seem to have been taken with the geographical distribution, the range of the various birds being carefully traced throughout the different districts of South Africa.

Some reviewers, we observe, have found fault with the omission of the characters of the families and genera which were given in the original work; but these were avowedly compiled, and not always accurate, and the space previously occupied by these paragraphs is now filled by a vast amount of original matter which is much more to the purpose.

Some idea of the way in which the scope of the book has been extended may be gathered from the fact that in the four parts already issued 322 species occupy 336 pages royal octavo, while in the original work the same number of species occupied only 163 pages demy octavo.

Ten species of Raptorial birds not found in the old edition are included in the new, and a proportionate increase in other orders is apparent as the work progresses.

The following are described as new for the first time:—*Caprimulgus fervidus* (page 86), *Andropadus hypoxanthus* (p. 205), *Crateropus Kirkii* (p. 213), *Æthocichla*, a new genus with the type *Æ. gymnogenys*, Hartlaub (p. 215), *Neocichla*, a new genus with the type *N. gutturalis*, Bocage (p. 215), *Pinarornis plumosus* (p. 230), *Saxicola Layardi* (p. 236), *Saxicola Shelleyi* (p. 246), *Saxicola Andersoni* (p. 249), *Drymæca hypoxantha* (p. 260), *Acrocephalus fulvolateralis* (p. 288), and *Zosterops atmori* (p. 326).

The coloured plates in this edition add considerably to the attractiveness and utility of the work. Four parts are already issued; we presume as many more will be necessary to complete it.

Naturgeschichte der Vögel Europa's, von Dr. Anton Fritsch, Custos der zoologischen Abtheilung am Museum des Königreiches Bohmen. 1 vol. 8vo, pp. 506 and Index, and Atlas, folio, 64 plates. Prague: F. Tempsky. London: Trübner and Co.

ALTHOUGH this is not a recently published work, having been issued in parts at Prague and completed in 1871, it is only recently that arrangements have been made for its publication in London, and as it is very little known in this country, certainly not so much as it deserves to be, we think it right to direct attention to it. Dr. Fritsch's 'Birds of Europe' is chiefly remarkable for the beautiful atlas of plates which accompanies the letterpress,

wherein all the birds mentioned in the text are coloured with a softness and fidelity to nature which at once commends them to the critical eye of the ornithologist. The figures are rather small, perhaps, but they convey an accurate idea of form and colour, if not always of relative size; and the possessor of any European bird-skin could not fail to identify the species from the plates, even if he had not the letterpress to assist him. In addition to the scientific names and synonyms, the name of each species is given in German and French, followed by a description of the species and a brief account of haunts and habits.

We are not sure about the cost of the work in England, but Messrs. Trübner & Co., who are the agents for the sale in this country, can supply information on this point, and will no doubt be glad to show a copy to any one desirous of inspecting it.

The Zoological Record; being Vol. XII. of the 'Record of Zoological Literature.' Edited by E. C. RYE, F.Z.S., M.E.S., &c. 8vo, pp. 592. 1877. London: Van Voorst.

THE aim and scope of this useful annual cannot be too widely made known. To those who are unacquainted with its nature it may be described as a book of reference for working zoologists, containing, in the shape of an annual volume, a complete index to the zoological literature of the year preceding that of its publication. No matter what branch of Zoology the reader may be interested in, he has only to turn to the proper page to ascertain all that has been written on that particular subject during the previous year, including notices not only of separate volumes, but even of essays and articles from every zoological journal of note.

Nor is it a mere index; for short abstracts of the more important publications are given, and the general scope of each article is indicated. To working zoologists the 'Record' is especially useful, as facilitating research and directing attention to recently published works and essays, both English and foreign, which bear upon the particular subject they may have in hand. The volume closes with an index to the new genera and subgenera which have been described in the course of the year.

THE ZOOLOGIST.

THIRD SERIES.

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SEPTEMBER, 1877.

[No. 9.

ON THE MAMMALIA OF NORTH GREENLAND
AND GRINNELL LAND.*

By H. W. FEILDEN, F.G.S., C.M.Z.S.

Lepus glacialis.—The Northern Hare was found, though in scanty numbers, along the shores of Grinnell Land, and its footprints were seen on the snow-clad ice of the Polar Sea by Captain Markham and Lieut. Parr, in lat. $83^{\circ} 10'$ N., a distance about twenty miles north of the nearest land. In the autumn of 1875 three or four examples were shot in the neighbourhood of our winter-quarters, lat. $82^{\circ} 27'$ N., and as soon as a glimmer of light enabled us to make out their tracks in the snow we were off in pursuit of them. I find from my journal that on the 14th February, two weeks before the sun reappeared at mid-day, the temperature minus 56° , I was hunting for these animals, and started one from its burrow. This hole was about four feet in length, and scraped horizontally into a snowdrift. I have no doubt the same burrow is regularly occupied, as this one was discoloured by the feet of the animal passing in and out, and a quantity of hair was sticking to the sides; all around the Hare had been scratching up the snow and feeding on *Saxifraga oppositifolia*. Even where exposed by the wind, this hardy plant had delicate green buds showing on the brown withered surface of the last year's growth. The Hare does not tear up this plant by the roots, but nibbles off the minute green shoots. Following a Hare in the twilight with a temperature ninety degrees below the freezing-point may not appear a very desirable

* Concluded from p. 321.

occupation, yet my journal, written at the time, records it as a pleasant day, and mentions the glow of light which at meridian marked the south, where the planet Venus was decreasing in brilliancy, and stars of the first magnitude had disappeared at noon, warming the heart with the genial hope of returning sunlight. On the 19th February a Hare was shot by Dr. Moss: it was a male, and weighed nine pounds and a half; and another was obtained on the 20th. I find the following reference to this animal in my note-book of the 18th May, 1876:—"Camp Westward Ho! Valley. Saw two Hares to-day, which I managed to secure: one was a female and contained eight young ones. These Arctic Hares are quaint-looking animals when disturbed. They stand erect on their hind legs, fore feet tucked in close to their bodies, then look around, and if not frightened recommence feeding; if startled they make off in a series of bounds, generally with one fore leg lifted up. This gives their tracks in the snow the appearance of having been made by a three-legged animal." By the end of July the young were nearly as large as their parents, and were pure white, save the tips of the ears, which were mouse-gray, with a small streak of the same colour passing down from the apex of the head to the snout. The adults have the ears tipped with black. The number of young that we found in gravid females varied from seven to eight, which is much in excess of that produced by *Lepus variabilis* in Great Britain, and from which naturalists have found difficulty in separating the Arctic species. Fabricius records the fact of this animal in Greenland having eight young ones. Near Lincoln Bay, in lat. $82^{\circ} 8' N.$, a Hare was shot on the 31st August, 1875, with a very distorted skull, the nasal bones being twisted to the right hand, the incisors of the upper jaw being deflected in the same direction. In the lower jaw only the left incisor was developed, and that protruded in a nearly horizontal direction. This specimen, though in good condition, was small, and weighed only five pounds and a half; another, killed the same day, nine pounds. They were both pure white, with tips of the ear black. We find, therefore, *Lepus glacialis* inhabiting the most northern land yet visited, and attaining its normal weight, eight to ten pounds, under apparently very adverse circumstances. Still I must say it is sparsely diffused, and we found that after killing a pair or two out of each valley that afforded any vegetation, the race seemed to be extirpated in that district, and I imagine it will

take several years to restock the area over which we hunted along the northern shore of Grinnell Land. Examples examined by me contained many parasitical worms (*Filaria*) in the large intestine.

Ovibos moschatus.—The attention of many distinguished naturalists has been given to the history of this animal, but the most important and exhaustive essay on the subject is that by Professor Boyd Dawkins, published in the volume of the Palæontological Society for 1871. There is an excellent article on the Musk-ox in the history of the German Arctic Expedition of 1869-70, and Dr. R. Brown, in his exhaustive paper on the Mammalian Fauna of Greenland, reprinted in the 'Admiralty Manual' of 1875 (from Proc. Zool. Soc.), gives full information in regard to the past and present range of this animal in Greenland. On my return from the Arctic Regions I was able to place in the hands of Dr. James Murie a few small portions of the stomach and other organs, so that before long we shall obtain some further insight into its anatomy from that accomplished physiologist. My regret is that the material given to Dr. Murie was extremely limited in amount. The fossil remains of *Ovibos* found in Siberia, North America, Germany, France and England have been determined by naturalists as identical with the species now found living in the northern regions of the American continent and the most northern and eastern shores of Greenland, whilst most of the larger Mammalia of the Pleistocene period, with which the Musk-ox was associated, have passed away. The Musk-ox, being truly an Arctic mammal, doubtless travelled northward as the glacial ice-cap contracted; but in Europe and Asia this animal found its limit of withdrawal bounded by the mainlands of the Old World. No trace of it has been discovered in Spitzbergen or Franz Joseph Land; and the reasonable conclusion is that the great extent of sea which separates these groups of islands from the continents, formed an insuperable obstacle to its progress in that direction. Doubtless its remains are to be found in the New Siberian Islands, and there is no valid reason why it should not still inhabit Kellett Land. So far as we know, however, the Musk-ox living on the Arctic shores of Asia had no inaccessible retreats analogous to the Parry Archipelago of America, and consequently when brought into collision with man must have quickly disappeared. Towards the close of the last Glacial period, when the Straits of Behring were doubtless as choked with

ice as the passage now is between Banks' Land and Melville Island, there could have been no great obstacle to prevent the passage of the Musk-ox from the Old World to the New; but whether its course of migration was from Asia to America, or contrariwise, there can be no question that on the latter continent it found a congenial home. Its remains have been discovered in greater or less quantities from Escholtz Bay on the west to the shores of Lancaster Sound, whilst the animal still inhabits the Barren-lands of the American continent. Even in this wilderness, sparsely inhabited by Eskimo, its southern range is slowly contracting, whilst, according to Richardson, the Mackenzie is now its western limit. Melville Island and other lands to the north of the American continent have proved a safe asylum to the Musk-ox, and there it will continue to propagate its species, undisturbed save by the casual appearance of Arctic voyagers. From the islands of the Parry group its range northwards across the eightieth parallel into Ellesmere and Grinnell Land, as high as the eighty-third parallel to the shores of the Polar Sea, is extremely natural; and Robeson Channel, which has presented no obstacle to the progress of the Lemming and Ermine, has also been crossed by the Musk-ox, the 'Polaris' Expedition as well as ours finding it in Hall Land. After crossing the strait between the American islands, and Greenland, the Musk-ox appears to have followed the coasts both in a northerly and southerly direction, its range in Greenland to the southward being stopped by the great glaciers of Melville Bay. At one time it must have been abundant on the West Greenland coast as far south as the seventy-eighth parallel, for Dr. Kane found numerous remains in the vicinity of Rensselaer Bay, and Dr. Hayes found a skull in Chester Valley at the head of Foulke Fiord. During the single day we explored in the neighbourhood of that locality two skulls were found by members of our Expedition. The destruction of these animals would, I think, rapidly follow on the appearance of the Eskimo at Port Foulke; for I imagine few animals are less fitted to elude the wiles of the hunter. There can be no question that the Musk-oxen found by the Germans on the east coast of Greenland are descendants of those that crossed Robeson Channel, rounded the north of the Greenland continent, and extended their range southward until they met with some physical obstruction that barred their further progress, as has also been the case on the western shore of

Greenland. Dr. Robert Brown, in his 'Essay on the Physical Structure of Greenland,' published by the Geographical Society for the use of the recent Arctic Expedition, thus refers to this range of the Musk-ox, Lemming and Ermine:—"These illustrations, though seemingly trivial in themselves, are yet of extreme zoo-geographical interest as tending to show that the Greenland land must end not far north of latitude 82° or 83°." In the month of August, 1875, we met with abundant traces of the Musk-ox in the Valley of the Twin Glacier, leading inland from the shores of Buchanan Strait. I noticed where these animals had been sheltering themselves under the lee of big boulders, as sheep do on bleak hill-sides, and that the same spots were frequently occupied was shown by the holes tramped out by the animals, and the large quantities of their long soft wool which was scattered around. Musk-oxen were obtained in considerable numbers near to the winter-quarters of the 'Discovery,' over forty being shot; but in the extreme north of Grinnell Land, nearer to the winter-quarters of the 'Alert,' they were much scarcer, only six having been obtained by the crew of that vessel, whilst at Thank God Harbour, where the 'Polaris' Expedition obtained over a score, only one was seen and shot. The range of the Musk-ox in Grinnell Land is confined to the coast line and the valleys debouching thereon. It is an animal by no means fitted to travel through the deep soft snow which blocks up the heads of all these valleys. On one occasion, in Westward Ho! Valley, in the month of May, Lieut. Egerton, R.N., and I came across fresh tracks of this animal in soft snow, through which it had sunk belly-deep, ploughing out a path, and leaving fragments of wool behind in its struggles. Its progression under such circumstances is similar to that of a snow-plough. We noticed that spots on hill-sides where the snow lay only a few inches deep had been selected for feeding grounds, the snow having been pushed away in furrows banked up at the end, as if the head and horns of the animal had been used for the task; a few blades of grass and roots of willow showed on what they had been feeding. The dung of the Musk-ox, though usually dropped in pellets like sheep or deer, is very often undistinguishable from that of the genus *Bos*. No person, however, watching this animal in a state of nature, could fail to see how essentially ovine are its actions. When alarmed they gather together like a flock of sheep herded by a collie dog, and the way in which they pack closely

together and follow blindly the vacillating leadership of the old ram is unquestionably sheep-like. When thoroughly frightened they take to the hills, ascending precipitous slopes, and scaling rocks with great agility. How the Musk-ox obtains food during the long Arctic night is very extraordinary; but that it is a resident throughout the year cannot be doubted, as a month after the reappearance of sun-light, in the end of March, and at the very coldest season of the year, we found the fresh traces of these animals in the vicinity of our winter-quarters. I am quite sure that the number of Musk-oxen in Grinnell Land is extremely limited, whilst the means of subsistence can only supply the wants of a fixed number; consequently, after an invasion such as ours, when every animal capable of affording food was ruthlessly but necessarily slaughtered, it must take some years to restock the ground. I lay stress upon this point, because the programme for future American research by Smith Sound contemplates the establishment of colonies at various points, one especially suggested being the winter-quarters of the 'Discovery' in Lady Franklin Sound, and some reference has been made to the abundance of game likely to be obtained there. The cause of the disagreeable odour which frequently taints the flesh of these animals has received no elucidation from my observations. It does not appear to be confined to either sex, or to any particular season of the year; for a young unweaned animal killed at its mother's side, and transferred within an hour to the stew-pans, was as rank and objectionable as any. The flesh of some of these animals of which I have partaken was dark, tender, and as well-flavoured as that of four-year old South-down mutton. Richardson states that the food of the Musk-ox is at one season of the year grass, at another lichen. Leaves and stems of the willow, with grasses, were in the stomachs I examined. This animal is infested with two species of worms, a *Tænia* and a *Filaria*.

Rangifer tarandus.—The Reindeer was not actually met with by our Expedition to the northward of Port Foulke, but its newly-shed horns were found in the Valley of the Twin Glacier, Buchanan Strait. I came across a skeleton recently picked by wolves in the neighbourhood of Radmore Harbour, lat. $80^{\circ} 27' N.$ At various points along the coast of Grinnell Land, further north, we came upon shed antlers, but these may have been of considerable

antiquity, whilst Lieutenant Giffard, R.N., found and brought to the ship a portion of an antler which he picked up in lat. $82^{\circ} 45' N.$ It does not appear that the 'Polaris' Expedition observed any trace of the Reindeer in Hall Land, neither was it obtained there by our Expedition.

Phoca hispida.—The Ringed Seal was met with in most of the bays we entered during our passage up and down Smith Sound. It was the only species seen north of Cape Union, and which penetrates into the Polar Sea. Lieutenant Aldrich, R.N., during his autumn sledging in 1875, noticed a single example in a pool of water near Cape Joseph Henry, and a party which I accompanied in September, 1875, secured one in Dumbell Harbour, some miles north of the winter-quarters of the 'Alert': its stomach contained remains of crustaceans and annelids. In June of the following year I observed three or four of these animals on the ice of Dumbell Harbour. They had made holes in the bay ice that had formed in this protected inlet. The Polar pack was at this time of the year still firmly wedged against the shores of Grinnell Land, and so tightly packed in Robeson Channel that no Seal could by any possibility have worked its way into this inlet from outside. I am therefore quite satisfied that *Phoca hispida* is resident throughout the year in the localities mentioned. A female killed on the 23rd August, 1876, weighed sixty-five pounds.

Phoca barbata.—On several occasions while proceeding up Smith Sound I observed this large Seal. We did not see it north of Robeson Channel. Individuals were procured in Discovery Bay, lat. $81^{\circ} 44' N.$, and also at Thank God Harbour, from whence it has been recorded by Dr. Bessels. As previously mentioned, I found the skulls of this animal in the ancient Eskimo settlements of Smith Sound. On the 31st August, 1876, Hans, the Greenlander on board the 'Discovery,' shot one of these Seals in Dobbin Bay. I was informed that it weighed 510 lbs. On taking off its skin an Eskimo harpoon was found buried in the blubber on its back; the socket of the dart was made of ivory, the blade being wrought iron. Hans pronounced it to be a Greenland harpoon-head, and suggested that the animal had been struck in the Danish settlements. *P. grœnlandica* is recorded by Dr. Bessels from Thank God Harbour, but I did not observe it in Smith Sound or northwards.

Trichechus rosmarus.—Kane and Hayes describe the Walrus as very abundant in the vicinity of Port Foulke, and the Eskimo of Etah no doubt capture a great number of them, as many skulls and bones of this animal are strewed about their settlement, which we found deserted in July, 1875. I came across a very well-finished sledge hid in a recess of the rocks near Etah, made entirely of Walrus bones, and shod with runners formed of pieces of the tusk, most carefully adjusted. Curiously enough, we did not see one of these animals in the vicinity of Port Foulke nor in Smith Sound, until we reached Franklin Pierce Bay. There, in the vicinity of Norman Lockyer Island, we saw several Walruses, and killed two or three. Their stomachs contained fragments of *mya* and *saxicava*, and a considerable quantity of a green oily matter. Near Cape Fraser I saw a single Walrus; but as far as my observation goes, it does not proceed further north than the meeting of the Baffin Bay and Polar tides near the above-mentioned Cape.

Balaena mysticetus.—A portion of the rib of a Greenland Whale was found by Lieutenant Egerton, R.N., on the northern shores of Grinnell Land, in lat. $82^{\circ} 33'$ N. It was of great antiquity, but I am unprepared to advance any opinion as to how it got there. I am, however, quite satisfied on one point; and that is—no Whale could inhabit at the present day the frozen sea to the North of Robeson Channel. To penetrate from the north-water of Baffin Bay to Robeson Channel would be a hazardous task for this great animal, and in this opinion the experienced whaling quarter-masters who accompanied our Expedition coincided. We may dismiss from our minds the idea or hope that nearer to the Pole, and beyond the limits of present discovery, there may be haunts in the Polar Sea suitable for the Right Whale. I do not look for the speedy extinction of the Greenland Whale; but it is probable that in a few years the fishing will no longer prove profitable to the fine fleet of whalers that now sail from our northern ports, and I see no hope of Arctic discovery increasing our knowledge of the range of this animal.

Monodon monoceros.—During the month of August, while we were waiting in Payer Harbour, near Cape Sabine, we noticed several Narwhals playing at the edge of the ice, but we saw no more of them after entering the pack of Smith Sound. The range of the Narwhal in that direction is no doubt coincident with

the summer extension of the north-water of Baffin Bay. It is not included by Dr. Bessels among the animals of Hall Land. An ancient tusk of the Narwhal was picked up by Lieut. Parr, R.N., on the shore of Grinnell Land, a little above the present sea-level, a few miles to the north of the winter-quarters of the 'Alert.'



THE OSSIFEROUS CAVERNS OF DEVONSHIRE.

By W. PENGELLY, F.R.S., F.G.S.*

WHEN, as long ago as 1841, the British Association made its only previous visit to Plymouth, some of us, now amongst its oldest members, thought ourselves too young to take any part in its proceedings. If the effects of that meeting are still traceable in this district, it will be admitted, of course, that the seed then sown was of excellent quality and that it fell on good soil. Be this as it may, the hope may be cherished that thirty-six years will not again be allowed to elapse between two consecutive visits to the capital of the two south-western counties. One effect of this wide hiatus is the loss of almost all the human links whose presence on this occasion would have pleasantly connected the present with the past. A glance at the lists of Trustees and the General, Sectional and Local officers in 1841 will show that the presence of scarcely one of them can be hoped for on this occasion; and there is but little probability that any of those who prepared Reports or Papers for the last Plymouth Meeting will have done so for that which is now assembled.

Nor are these the only changes. In 1841 Section C embraced, as at the beginning, the geographers as well as the geologists; but ten years later the geographers were detached, whether to find room for themselves, or to make room for the students of an older geography, it is not necessary to inquire. Some years afterwards came an innovation which, until entering on the preparation of this Address, I always regarded as a decided improvement. The first Presidential Address to this Section was delivered at Leeds in 1858, by the late Mr. Hopkins, so well known to geologists for his able application of his great mathematical powers to sundry important problems in their science; and from that time to the

* Opening Address as President of Section C. Read at the Meeting of the British Association, Plymouth, August, 1877.

present, with the exception of the Meetings of 1860 and 1870 only, the President of this Section has delivered an Address.

None of the local geological papers read in 1841 appear to have attracted so much attention as those on Lithodomous Perforations, Raised Beaches, Submerged Forests, and Caverns (see 'Athenæum' for 7th to 28th of August, 1841); and, as an effort to connect the present with the past, I have decided upon taking up one of these threads, and devoting the remarks I have now to offer to the History of Cavern-Exploration in Devonshire. I am not unmindful that there were giants in those days; and no one can deplore more than I do our loss of Buckland and De la Beche, amongst many others; nor can I forget the enormous strides opinion has made since 1841, when, in this Section, Dr. Buckland "contended that human remains had never been found under such circumstances as to prove their contemporaneous existence with the Hyænas and Bears of the caverns;" and added that "in Kent's Hole the Celtic knives . . . were found in holes *dug by art*, and which had disturbed the floor of the cave and the bones below it" ('Athenæum,' 14th Aug. 1841, p. 626). This scepticism, however, did the good service of inducing cavern explorers to conduct their researches with an accuracy which should place their results, whatever they might prove to be, amongst the undoubted additions to human knowledge.

The principal caverns in South Devon occur in the limestone districts of Plymouth, Yealmpton, Brixham, Torquay, Buckfastleigh, and Chudleigh; but as those in the last two localities have yielded nothing of importance to the anthropologist or the palæontologist, they will not be further noticed on this occasion. In dealing with the others it seems most simple to follow mainly the order of chronology; that is to say, to commence with the cavern which first caught scientific attention, and, having finished all that the time at my disposal will allow me to say about it, but not before, to proceed to the next, in the order thus defined; and so on through the series.

Oreston Caverns.—When Mr. Whidbey engaged to superintend the construction of the Plymouth Breakwater, Sir Joseph Banks, President of the Royal Society, requested him to examine narrowly any caverns he might meet with in the limestone-rock to be quarried at Oreston, near the mouth of the River Plym, not more than two miles from the room in which we are assembled, and have the bones or any other fossil remains that were met with carefully preserved

(see Phil. Trans. 1817, pp. 176—182). This request was cheerfully complied with, and Mr. Whidbey had the pleasure of discovering bone-caves in November, 1816, November, 1820, August and November, 1822, and of sending the remains found in them to the Royal Society. It is, perhaps, worthy of remark that, though cavern-researches received a great impulse from the discoveries in Kirkdale, Yorkshire, and especially from Dr. Buckland's well-known and graphic description of them, such researches had originated many years before. The request by Sir Joseph Banks was made at least as early as 1812 (see Trans. Devon. Assoc. v. pp. 252, 253), and a paper on the Oreston discoveries was read to the Royal Society in February, 1817, whereas the Kirkdale Cavern was not discovered until 1821. British cave-hunting appears to have been a science of Devonshire birth. The Oreston Caverns soon attracted a considerable number of able observers; they were visited in 1822 by Dr. Buckland and Mr. Warburton; and in a comparatively short time became the theme of a somewhat voluminous literature. Nothing of importance, however, seems to have been met with from 1822 until 1858, when another cavern, containing a large number of bones, was broken into. Unfortunately there was no one at hand to superintend the exhumation of the specimens; the work was left entirely to the common workmen, and was badly done; many of the remains were dispersed beyond recovery; the matrix in which they were buried was never adequately examined; and we are utterly ignorant, and must for ever remain so, as to whether they did or did not contain indications of human existence. I visited the spot from time to time, and bought up everything to be met with; but other scientific work in another part of the county occupied me too closely to allow more than an occasional visit. The greater part of the specimens I secured were lodged in the British Museum, where they seem to have been forgotten, whilst a few remain in my private collection. Some difference of opinion has existed respecting the character of the successive caverns, and much mystery has been imported into the question of the introduction of their contents. Mr. Whidbey, it is said, "saw no possibility of the cavern of 1816 having had any external communication through the rock in which it was enclosed" (Phil. Trans. 1817, pp. 176—182); but Dr. Buckland was of opinion that they were all at first fissures open at the top, and "that the openings had been long filled up with rubbish, mud, stalactite, or fragments

of rock cemented, as sometimes happens, into a breccia as solid as the original rock, and overgrown with grass" (Phil. Trans. 1822, pp. 171—240). The conclusion I arrived at, after studying so much of the roof of the cavern of 1858 as remained intact, was that Dr. Buckland's opinion was fully borne out by the facts; that, in short, the Oreston Caverns were *Fissure Caverns*, not *Tunnel Caverns*. The cavern of 1858 was an almost vertical fissure, extending a length of about 90 feet from N.N.E. to S.S.W. It commenced at about 8 feet below the surface of the plateau, continued thence to the base of the cliff, but how much further was not known, and its ascertained height was about 52 feet. It was 2 feet wide at top, whence it gradually widened to 10 feet at bottom. The roof, judging from that part which had not been destroyed, was a mass of limestone-breccia, made up of large angular fragments, cemented with carbonate of lime, and requiring to be blasted as much as ordinary limestone. The cavern was completely filled with deposits of various kinds. The uppermost 8 feet consisted of loose angular pieces of limestone, none of which exceeded 10 lbs. in weight, mixed with a comparatively small amount of such sand as is common in dolomitised limestone districts, but without a trace of stalagmite or fossil of any kind. The 32 feet next below were occupied with similar materials, with the addition of a considerable quantity of tough, dark, unctuous clay. Between this mass and the outer wall of the cavern was a nearly vertical plate of stalagmite, usually about 2 feet thick, and containing, at by no means wide intervals, firmly cemented masses of breccia identical in composition with the adjacent bed just mentioned. The bones the cavern yielded were all found within these 32 feet; and were met with equally in the loose and the coherent breccia, as well as in the stalagmite. A somewhat considerable number of ellipsoidal balls of clay, from 1·5 to 2·5 inches in greatest diameter, occurred in the clay of this bone-bed, but not elsewhere. Still lower was a mass of dark, tough, unctuous clay, containing a very few, small, angular stones, but otherwise perfectly homogeneous, and known to be 12 feet deep, but how much more was undetermined. The osseous remains found at Oreston prior to 1858 have been described by Sir E. Home, Mr. Clift, Dr. Buckland, Prof. Owen, Mr. Busk, and others. The animals represented were *Ursus priscus*, *U. spelæus*, Weasel (?), Wolf, Fox, Cave Hyæna, Cave Lion, *Rhinoceros leptorhinus*, *Equus fossilis*, *E. plicidens*,

Asinus fossilis, *Bison minor*, *Bos longifrons*, and, according to the late Mr. Bellamy, Mammoth and Hippopotamus (see Nat. Hist. of S. Devon, 1839, p. 82). With regard to Hippopotamus, I can only say that I have never met with satisfactory evidence of its occurrence in Devonshire; but the Mammoth was certainly found at Oreston in 1858; and, unless I am greatly in error, remains of *Rhinoceros tichorhinus* were also met with there, and lodged by me in the British Museum. It may be added that the skull and other relics of a Hog were exhumed on that occasion, and now belong to my collection. There was nothing to suggest that the cavern had been the home of the Hyæna; and whilst I fully accept Dr. Buckland's opinion that animals had fallen into the open fissures and there perished, and that the remains had subsequently been washed thence into the lower vaultings" (Reliq. Dil., 2nd ed. 1834, p. 78), I venture to add that some of the animals may have retired thither to die; a few may have been dragged or pursued there by beasts of prey; whilst rains, such as are not quite unknown in Devonshire in the present day, probably washed in some of the bones of such as died near at hand on the adjacent plateau. Nothing appears to have been met with suggestive of human visits.

Kent's Hole.—About a mile due east from Torquay Harbour and half a mile north from Torbay there is a small wooded limestone hill, the eastern side of which is, for the uppermost 30 feet, a vertical cliff, having at its base, and 54 feet apart, two apertures leading into one and the same vast cavity in the interior of the hill, and known as Kent's Hole or Cavern. These openings are about 200 feet above mean sea-level, and from them the hill slopes rapidly to the valley at its foot, at a level of from 60 to 70 feet below. There seems to be neither record nor tradition of the discovery of the cavern. Richardson, in the 8th edition of 'A Tour through the Island of Great Britain,' published in 1778, speaks of it as "perhaps the greatest natural curiosity" of the county; its name occurs on a map dated 1769; it is mentioned in a lease 1659; visitors cut their names and dates on the stalagmite from 1571 down to the present century; judging from numerous objects found on the floor, it was visited by man through mediæval back to pre-Roman times; and, unless the facts exhumed by explorers have been misinterpreted, it was a human home during the era of the Mammoth and his contemporaries. In 1824 Mr. Northmore, of Cleve, near Exeter, was led to make a few diggings in the cavern, and was the first to

find fossil bones there. He was soon followed by Mr. (now Sir) W. C. Trevelyan, who not only found bones, but had a plate of them engraved. In 1825, the Rev. J. MacEnery, an Irish Roman Catholic priest residing in the family of Mr. Cary, of Tor Abbey, Torquay, first visited the cavern, when he, too, found teeth and bones, of which he published a plate. Soon after, he made another visit, accompanied by Dr. Buckland, when he had the good fortune to discover a flint implement—the first instance, he tells us, of such a relic being noticed in any cavern (see *Trans. Devon Assoc.* iii. p. 441). Before the close of 1825 he commenced a series of more or less systematic diggings, and continued them until, and perhaps after, the summer of 1829 (*ibid.* p. 295). Preparations appear to have been made to publish the results of his labours; a prospectus was issued, numerous plates were lithographed, it was generally believed that the MS. was almost ready, and the only thing needed was a list of subscribers sufficient to justify publication, when, alas! on February 18, 1841, before the printer had received any "copy," before even the world of science had accepted his anthropological discoveries—before the value of his labours was known to more than a very few—Mr. MacEnery died at Torquay. After his decease his MS. could not be discovered, and its loss was duly deplored. Nevertheless, it was found after several years, and, having undergone varieties of fortune, became the property of Mr. Vivian, of Torquay, who, having published portions of it in 1859, presented it in 1867 to the Torquay Natural History Society, whose property it still remains. In 1869 I had the pleasure of printing the whole in the 'Transactions' of the Devonshire Association. Whilst Mr. MacEnery was conducting his researches, a few independent diggings, on a less extensive scale, were taken by other gentlemen. The principal of these was Mr. Godwin-Austen, the well-known geologist, whose papers fully bore out all that MacEnery had stated (see *Trans. Geol. Soc. Lond.*, 2nd series, vi. p. 446). In 1846 a sub-committee of the Torquay Natural History Society undertook the careful exploration of very small parts of the cavern, and their Report was entirely confirmatory of the statements of their predecessors—that undoubted flint implements did occur, mixed with the remains of extinct mammals, in the cave-earth, beneath a thick floor of stalagmite. The sceptical position of the authorities in geological science remained unaffected, however, until 1858, when the discovery and systematic exploration of a comparatively

small virgin cavern on Windmill Hill, at Brixham, led to a sudden and complete revolution; for it was seen that whatever were the facts elsewhere, there had undoubtedly been found at Brixham flint implements commingled with remains of the Mammoth and his companions, and in such a way as to render it impossible to doubt that man occupied Devonshire before the extinction of the cave mammals. Under the feeling that the statements made by MacEnery and his followers respecting Kent's Hole were perhaps, after all, to be accepted as verities, the British Association, in 1864, appointed a committee to make a complete, systematic and accurate exploration of the cavern, in which it was known that very extensive portions remained entirely intact. This committee commenced its labours on March 28, 1865; it has been reappointed, year after year, with sufficient grants of money, up to the present time; the work has gone on continuously throughout the entire thirteen years; and the result has been, not only a complete confirmation of Mr. MacEnery's statements, but the discovery of far older deposits than he suspected—deposits implying great changes of, at least, local geographical conditions; changes in the fauna of the district; and yielding evidence of men more ancient and far ruder than even those who made the oldest flint tools found in Kent's Hole prior to the appointment of the committee. The cavern consists of a series of chambers and passages, which resolve themselves into two main *divisions*, extending from nearly north to south in parallel lines, but passing into each other near their extremities, and throwing off branches, occasionally of considerable size. The successive deposits, in descending order were—

1st, or uppermost. Fragments of block and limestone from an ounce to upwards of 100 tons weight each, which had fallen from the roof from time to time, and were, in some instances, cemented with carbonate of lime.

2nd. Beneath and between these blocks lay a dark-coloured mud or mould, consisting largely of decayed leaves and other vegetable matter. It was from 3 to 12 inches thick, and known as the *black mould*. This occupied the entire eastern division, with the exception of a small chamber in its south-western end only, but was not found in the other, the remoter, parts of the cavern.

3rd. Under this was a stalagmitic floor, commonly of granular texture, and frequently laminated, from less than an inch to fully five feet in thickness, and termed the *granular stalagmite*.

4th. An almost black layer, about four inches thick, composed mainly of small fragments of charred wood, and distinguished as the *black band*, occupied an area of about 100 square feet, immediately under the granular stalagmite, and, at the nearest point, not more than thirty-two feet from one of the entrances to the cavern. Nothing of the kind has occurred elsewhere.

5th. Immediately under the granular stalagmite and the black band lay a light red clay, containing usually about 50 per cent. of small angular fragments of limestone, and somewhat numerous blocks of the same rock as large as those lying on the black mould. In this deposit, known as the *cave-earth*, many of the stones and bones were, at all depths, invested with thin stalagmitic films. The cave-earth was of unknown depth near the entrances, where its base had never been reached; but in the remoter parts of the cavern it did not usually exceed a foot, and in a few localities it "thinned out" entirely.

6th. Beneath the cave-earth there was usually found a floor of stalagmite having a crystalline texture, and termed on that account the *crystalline stalagmite*. It was commonly thicker than the granular floor, and in one instance but little short of 12 feet.

7th. Below the whole occurred, so far as is at present known, the oldest of the cavern deposits. It was composed of subangular and rounded pieces of dark-red grit, embedded in a sandy paste of the same colour. Small angular fragments of limestone, and investing films of stalagmite, both prevalent in the cave-earth, were extremely rare. Large blocks of limestone were occasionally met with; and the deposit, to which the name of *breccia* were given, was of a depth exceeding that to which the exploration has yet been carried.

Except in a very few small branches, the bottom of the cavern has nowhere been reached. In the cases in which there was no cave-earth, the granular stalagmite rested immediately on the crystalline; and where the crystalline stalagmite was not present the cave-earth and breccia were in direct contact. Large isolated masses of the crystalline stalagmite, as well as concreted lumps of the breccia, were occasionally met with in the cave-earth, thus showing that the older deposits had, in portions of the cavern, been partially broken up, dislodged, and re-deposited. No instance was met with of the incorporation in a lower bed of fragments derived from an upper one. In short, wherever all the deposits were found in one and the same vertical section, the order of superposition

was clear and invariable; and elsewhere the succession, though defective, was never transgressed. Excepting the overlying blocks of limestone, of course, all the deposits contained remains of animals, which, however, were not abundant in the stalagmites. The black mould, the uppermost bed, yielded teeth and bones of Man, Dog, Fox, Badger, Brown Bear, *Bos longifrons*, Roedeer, Sheep, Goat, Pig, Hare, Rabbit, and Seal—species still existing, and almost all of them in Devonshire. This has been called the *Ovine* bed, the remains of Sheep being restricted to it. In it were also found numerous flint flakes and “strike-lights,” stone spindle-whorls, fragments of curvilinear pieces of slate, amber beads, bone tools, including awls, chisels, and combs; bronze articles, such as rings, a fibula, a spoon, a spear-head, a socketed celt, and a pin; pieces of smelted copper, and a great number and variety of potsherds, including fragments of Samian ware. The granular stalagmite, black band, and cave-earth, taken together as belonging to one and the same biological period, may be termed the *Hyænine* beds, the Cave Hyæna being their most prevalent species, and found in them alone. So far as they have been identified, the remains belong to the Cave Hyæna, *Equus caballus*, *Rhinoceros tichorhinus*, gigantic Irish Deer, *Bos primigeneus*, *Bison priscus*, Red Deer, Mammoth, Badger, Cave Bear, Grizzly Bear, Brown Bear, Cave Lion, Wolf, Fox, Reindeer, Beaver, Glutton, *Machairodus latidens*, and Man—the last being a part of a jaw with teeth, in the granular stalagmite. In the same beds were found unpolished *ovate* and *lanceolate* implements made from *flakes*, not *nodules*, of flint and chert; flint flakes, chips, and “cores;” “whetstones,” a “hammer-stone,” dead shells of *Pecten*, bits of charcoal and bone tools, including a needle or bodkin having a well-formed eye, a pin, an awl, three harpoons, and a perforated tooth of Badger. The artificial objects, of both bone and stone, were found at all depths in each of the hyænine beds, but were much more numerous below the stalagmite than in it. The relics found in the crystalline stalagmite and the breccia, in some places extremely abundant, were almost exclusively those of Bear, the only exceptions being a very few remains of Cave Lion and Fox. Hence these have been termed the *Ursine* beds. It will be remembered that teeth and bones of Bear were also met with in both the hyænine and the ovine beds; and it should be understood that this biological classification is intended to apply to Kent’s Cavern only. The ursine deposits, or

rather the breccia, the lowest of them, also yielded evidences of human existence; but they were exclusively tools made from *nodules*, not *flakes*, of flint and chert.

Ansty's-Cove Cavern.—About three furlongs from Kent's Hole towards N.N.E., near the top of the lofty cliff forming the northern boundary of the beautiful Ansty's Cove, Torquay, there is a cavern where, simultaneously with those in Kent's Cavern, Mr. MacEnery conducted some researches, of which he has left a brief account (see *Trans. Devon. Assoc.* vi. pp. 61—69). I have visited it several times, but it seems to be frequently kept under lock and key, as a tool and powder-house, by the workmen in a neighbouring quarry. It is a simple gallery, and, according to Mr. MacEnery, 63 feet long, from 3 to 9 feet high, and from 3 to 6 feet broad. Beneath some angular stones he found a stalagmitic floor 14 inches thick, and in the deposit below remains of Deer, Horse, Bear, Fox, Hyæna (?), coprolites, a few marine and land shells, one white flint tool with fragments of others, a Roman coin, and potsherds. In a letter to Sir W. C. Trevelyan, dated 16th December, 1825, Dr. Buckland states that Mr. MacEnery had found in this cave “bones of all sorts of beasts, and also flint knives and Roman coins; in short, an open-mouthed cave, which has been inhabited by animals of all kinds, quadruped and biped, in all successive generations, and who have all deposited their exuviae one upon another” (*ibid.* p. 69).

Yealm-Bridge Cavern.—About the year 1832 the workmen broke into a bone-cavern in Yealm-Bridge Quarry, about one mile from the village of Yealmpton, and eight miles E.S.E. from Plymouth; and through their operations it was so nearly destroyed that but a small arm of it remained in 1835, when it was visited by Mr. J. C. Bellamy, who at once wrote an account of it, from which it appears that, so far as he could learn, the cavern was about 30 feet below the original limestone surface, and was filled to from 1 foot to 6 feet of the roof (see *Nat. Hist. S. Devon.* 1839, pp. 86—105). In the same year, but subsequently, it was examined by Captain (afterwards Colonel) Mudge, who states that there were originally three openings into the cave, each about 12 feet above the River Yealm; that the deposits were, in descending order:—

1. Loam with bones and stones	3·5 feet
2. Stiff whitish clay	2·5 „
3. Sand	6·0 „
4. Red clay	3·5 „
5. Argillaceous sand	6 to 18·0 „

and that, where they did not reach the roof, deposits were covered with stalagmite. On the authority of Mr. Clift and Prof. Owen, Capt. Mudge mentions relics of Elephant, Rhinoceros, Horse, Ox, Sheep, Hyæna, Dog, Wolf, Fox, Bear, Hare, and Water Vole. The bones, and especially the teeth, of the Hyæna exceeded in number those of all the other animals, though remains of Horse and Ox were very abundant. Mr. Bellamy, whilst also mentioning all the foregoing forms, with the exception of Dog only, adds Deer, Pig, Glutton, Weasel, and Mouse. He also speaks of the abundance of bones and teeth of Hyæna, but seems to regard the Fox as being almost as fully represented; and next in order he places Horse, Deer, Sheep, and Rabbit or Hare; whilst the reliques of Elephant, Wolf, Bear, Pig, and Glutton are spoken of as very rare. The bones, he says, were found in the uppermost bed only. They were frequently mere fragments and splinters, some being undoubtedly gnawed, and all had become very adherent through loss of their animal matter. Those of cylindrical form were without their extremities; there was no approach to anatomical juxtaposition; and the remains belonged to individuals of all ages. Reliquæ of carnivorous animals greatly exceeded those of the Herbivora, and teeth were very abundant. Coprolites occurred at some depth below the stalagmite, in the upper bed, which also contained granitic and trappean pebbles, and lumps of breccia made up of fragments of rock, bones, pebbles, and stalagmite. The bones found prior to 1835 had been removed as rubbish, and some good specimens were recovered from materials employed in making a pathway. Nothing indicating the presence of man appears to have been found.

The Ash-Hole.—On the southern shore of Torbay, midway between the town of Brixham and Berry Head, and about half a mile from each, there is a cavern known as the “Ash-Hole.” It was partially explored, probably about, or soon after, the time Mr. MacEnery was engaged in Kent’s Hole, by the late Rev. H. F. Lyte, who, unfortunately, does not appear to have left any account of the results. The earliest mention of this cavern I have been able to find is a very brief one in Bellamy’s ‘Natural History of South Devon,’ published in 1839 (p. 14). During the Plymouth Meeting in 1841, Mr. George Bartlett, a native of Brixham, who assisted Mr. Lyte, described in this Section the objects of interest the Ash-Hole had yielded (see Report Brit. Assoc. 1851, Trans.

Sections, p. 61). So far as was then known, the cave was thirty yards long and six yards broad. Below a recent accumulation, four feet deep, of loam and earth, with land and marine shells, bones of the domestic fowl and of man, pottery, and various implements, lay a true cave-earth, abounding in the remains of Elephant. Prof. Owen, who identified, from this lower bed, relics of Badger, Polecat, Stoat, Water Vole, Rabbit, and Reindeer, remarks, that for the first good evidence of the Reindeer in this island he had been indebted to Mr. Bartlett, who stated that the remains were found in this cavern (see Brit. Foss. Mam. 1846, pp. 109-110, 113-114, 116, 204, 212, 479-480). I have made numerous visits to the spot, which, when Mr. Lyte began his diggings, must have been a shaft-like fissure, accessible from the top only. A lateral opening, however, has been quarried into it; there is a narrow tunnel extending westward, in which the deposit is covered with a thick sheet of stalagmite, and where one is tempted to believe that a few weeks' labour might be well invested.

Brixham Cavern.—Early in 1858 an unsuspected cavern was broken into by quarrymen at the north-western angle of Windmill Hill at Brixham, at a point 75 feet above the surface of the street, almost vertically below, and 100 feet above mean tide. On being found to contain bones, a lease in it was secured for the Geological Society of London, who appointed a committee of their members to undertake its exploration; funds were voted by the Royal Society, and supplemented by private subscriptions; the conduct of the investigation was intrusted to Mr. Prestwich and myself; and the work, under my superintendence, as the only resident member of the committee, was begun in July, 1858, and completed at midsummer, 1859. The cavern, comprised within a space of 135 feet from north to south, and 100 from east to west, consisted of a series of tunnel galleries from 6 to 8 feet in greatest depth, and 10 to 14 feet in height, with two small chambers and five external entrances. The deposits, in descending order, were:—

1st, or uppermost. A floor of stalagmite, from a few inches to a foot thick, and continuous over very considerable areas, but not throughout the entire cavern.

2nd. A mass of small angular fragments of limestone, cemented into a firm concrete with carbonate of lime, commenced at the principal entrance, which it completely filled, and whence it extended 34 feet only. It was termed the "first bed."

3rd. A layer of blackish matter, about 12 feet long, and nowhere more than a foot thick, occurred immediately beneath the first bed, and was designated the "second bed."

4th. A red, tenacious, clayey loam, containing a large number of angular and subangular fragments of limestone, varying from very small bits to blocks a ton in weight, made up the "third bed." Pebbles of trap, quartz, and limestone were somewhat prevalent, whilst nodules of brown hematite of iron and blocks of stalagmite were occasionally met with in it. The usual depth of the bed was from 2 to 4 feet, but this was exceeded by 4 or 5 feet in two localities.

5th. The third bed lay immediately on an accumulation of pebbles of quartz, greenstone, grit, and limestone, mixed with small fragments of shale. The depth of this, known as the "fourth" or "gravel bed," was undetermined; for, excepting a few feet only, the limestone bottom was nowhere reached. There is abundant evidence that this bed, as well as a stalagmitic floor which had covered it, had been partially broken up and dislodged before the introduction of the third bed.

Organic remains were found in the stalagmitic floor and in each of the beds beneath it, with the exception of the second only; but as ninety-five per cent. of the whole series occurred in the third, this was not unfrequently termed the "bone bed." The mammals represented in the stalagmite were Bear, Reindeer, *Rhinoceros tichorhinus*, Mammoth, and Cave Lion. The first bed yielded Bear and Fox only. In the third bed were found relics of Mammoth, *Rhinoceros tichorhinus*, Horse, *Bos primigenius*, *B. longifrons*, Red Deer, Reindeer, Roebuck, Cave Lion, Cave Hyæna, Cave Bear, Grizzly Bear, Brown Bear, Fox, Hare, Rabbit, *Lagomys spelæus*, Water Vole, Shrew, Polecat, and Weasel. The only remains met with in the fourth bed were those of Bear, Horse, Ox, and Mammoth. The human industrial remains exhumed in the cavern were flint implements and a hammer-stone, and occurred in the third and fourth beds only. The pieces of flint met with were thirty-six in number. Of these fifteen are held to show evidence of having been artificially worked, in nine the workmanship is rude or doubtful, four have been mislaid, and the remainder are believed not to have been worked at all (see Phil. Trans. vol. 163, 1873, pp. 561, 562). Of the undoubtedly tools, eleven were found in the third and four in the fourth bed. Two of those yielded by the

third bed, found forty feet apart, in two distinct but adjacent galleries, and one a month before the other, proved to be parts of one and same *nodule*-tool ; and I have little or no doubt that it had been washed out of the fourth bed and re-deposited in the third. The hammer-stone was a quartzite pebble, found in the upper portion of the fourth bed, and bore distinct marks of the use to which it was applied. Speaking of the discovery of the tools just mentioned, Mr. Prestwich said in 1859 :—“ It was not until I had myself witnessed the conditions under which flint implements had been found at Brixham, that I became fully impressed with the validity of the doubts thrown upon the previously prevailing opinions with respect to such remains in caves ” (Phil. Trans. 1860, p. 280) ; and according to Sir C. Lyell, writing in 1863 :—“ A sudden change of opinion was brought about in England respecting the probable co-existence, at a former period, of man and many extinct mammalia, in consequence of the results obtained from the careful exploration of a cave at Brixham. . . . The new views very generally adopted by English geologists had no small influence on the subsequent progress of opinion in France ” (Antiquity of Man, pp. 96, 97).

Bench Cavern.—Early in 1861 information was brought me that an ossiferous cave had just been discovered at Brixham, and, on visiting the spot, I found that, of the limestone quarries worked from time to time in the northern slope of Furzeham Hill, one known as Bench Quarry, about half a mile due north of Windmill Hill Cavern, and almost overhanging Torbay, had been abandoned in 1839, and that work had been recently resumed in it. It appeared that in 1839 the workmen had laid bare the greater part of a vertical dyke, composed of red clayey loam and angular pieces of limestone, forming a coherent wall-like mass, 27 feet high, 12 feet long, 2 feet in greatest thickness, and at its base 128 feet above sea-level. In the face of it lay several fine relics of the ordinary cave mammals, including an entire left lower jaw of *Hyæna spelæa* replete with teeth, but which had nevertheless failed to arrest the attention of the incurious workmen who exposed it, or of any one else. Soon after the resumption of the work in 1861, the remnant of the outer wall of the fissure was removed, and caused the fall of an incoherent part of the dyke, which it had previously supported. Amongst the *débris* the workmen collected some hundreds of specimens of skulls, jaws, teeth, vertebra, portions of antlers, and bones, but no indications of man. Mr. Wolston, the proprietor, sent some

of the choicest specimens to the British Museum, and submitted the remainder to Mr. Ayshford Sanford, F.G.S., from whom I learn that the principal portion of them are relics of the Cave Hyæna, from the unborn whelp to very aged animals. With them, however, were remains of Bear, Reindeer, Ox, Hare, *Arvicola ratticeps*, *A. agrestis*, Wolf, Fox, and part of a single maxillary with teeth not distinguishable from those of *Canis isatis*. To this list I may add Rhinoceros, of which Mr. Wolston showed me at least one bone.

From the foregoing undesirably, but unavoidably, brief descriptions, it will be seen that the Devonshire caverns, to which attention has been now directed, belong to two classes—those of Oreston, the Ash-Hole, and Bench being *Fissure Caves*; whilst those of Yealm Bridge, Windmill Hill at Brixham, Kent's Hole, and Ansty's Cove are *Tunnel Caves*.

Windmill Hill and Kent's Hole Caverns have alone been satisfactorily explored; and besides them none have yielded evidence of the contemporaneity of man with the extinct cave mammals.

Oreston is distinguished as the only known British cavern which has yielded remains of *Rhinoceros leptorkinus* (Quart. Journ. Geol. Soc. xxxvi. p. 456).

Yealm Bridge Cavern, if we may accept Mr. Bellamy's identification in 1835, was the first in this country in which relics of Glutton were found (South Devon Monthly Museum, vi. pp. 218—223; see also Nat. Hist. S. Devon., 1839, p. 19). The same species was found in the caves of Somerset and Glamorgan in 1865 (Pleist. Mam., Pal. Soc., pp. xxi., xxii.), in Kent's Hole in 1869 (Rep. Brit. Assoc. 1869, p. 207), and near Plas Heaton, in North Wales, in 1870 (Quart. Journ. Geol. Soc. xxvii. p. 407).

Kent's Hole is the only known British cave which has afforded remains of Beaver (Rep. Brit. Assoc. 1869, p. 208), and up to the present year the only one in which the remains of *Machairodus latidens* had been met with. Indeed Mr. MacEnery's statement, that he found in 1826 five canines and one incisor of this species in the famous Torquay cavern was held by many palæontologists to be so very remarkable as, at least, to approach the incredible, until the Committee now engaged in the exploration exhumed, in 1872, an incisor of the same species, and thereby confirmed the announcement made by their distinguished predecessor nearly half a century before (Rep. Brit. Assoc. 1872, p. 46).

In April last (1877) the Rev. J. M. Mello was able to inform the Geological Society of London that Derbyshire had shared with Devon the honour of having been a home of *Machaerodus latidens*, he having found its canine tooth in Robin Hood Cave, in that county, and that there, as in Kent's Hole, it was commingled with remains of the Cave Hyæna and its contemporaries (Abs. Proc. Geol. Soc., No. 334, pp. 3, 4).

The Ash-Hole, as we have already seen, afforded the first good evidence of a British Reindeer.

In looking at the published reports on the two famous Torbay caverns it will be found that they have certain points of resemblance as well as some of dissimilarity :—

1st. The lowest known bed in each is composed of materials which, whilst they differ in the two cases, agree in being such as may have been furnished by the districts adjacent to the cavern-hills respectively, but not by the hills themselves, and must have been deposited prior to the existing local geographical conditions. In each this bed contained flint implements and relics of Bear, but in neither of them those of Hyæna. In short, the *fourth bed* of Windmill Hill Cavern, Brixham, and the *breccia* of Kent's Hole, Torquay, are coeval, and belong to what I have called the *Ursine* period of the latter.

2nd. The beds just mentioned were in each cavern sealed with a sheet of stalagnite, which was partially broken up, and considerable portions of the subjacent beds were dislodged before the introduction of the beds next deposited.

3rd. The great bone bed, both at Brixham and Torquay, consisted of red clayey loam, with a large percentage of angular fragments of limestone; and contained *flake* implements of flint and chert, inoculating with remains of Mammoth, the Tichorhine Rhinoceros, and Hyæna. In fine, the *cave-earth* of Kent's Hole and the *third bed* of Brixham Cavern correspond in their materials, in their osseous contents, and in their flint tools. They both belong to what I have named the *Hyænine* period of the Torquay Cave.

But, as already stated, there are points in which the two caverns differ :—

1st. Whilst Kent's Hole was the home of man, as well as of the contemporary Hyæna during the absences of the human occupant, there is no reason to suppose that either man or any of the lower

animals ever did more than make occasional visits to Brixham Cave. The latter contained no flint-chips, no bone-tools, no utilized *Pecten*-shells, no bits of charcoal, and no coprolites of *Hyæna*, all of which occurred in the cave-earth of Kent's Hole.

2nd. In the Torquay Cave relics of *Hyæna* were much more abundant in the cave-earth than those of any other species. Taking the teeth alone, of which vast numbers were found, those of the *Hyæna* amounted to about 30 per cent. of the entire series, notwithstanding the fact that, compared with most of the cave-mammals, his jaws, when furnished completely, possess but few teeth. At Brixham, on the other hand, his relics of all kinds amounted to no more than 8·5 per cent. of all the osseous remains, whilst those of the Bear rose to 53 per cent.

3rd. The entrances of Brixham Cavern were completely filled up and its history suspended not later than the end of the Palæolithic era. Nothing occurred within it from the days when Devonshire was occupied by the Cave and Grizzly Bears, Reindeer, Rhinoceros, Cave Lion, Mammoth, and Man, whose best tools were unpolished flints, until the quarrymen broke into it early in A.D. 1858. Kent's Cavern, on the contrary, seems to have never been closed, never unvisited by man, from the earliest Palæolithic times to our own, with the possible exception of the Neolithic era, of which it cannot be said to have yielded any certain evidence.

Though my "History of Cavern Exploration in Devonshire" is now completed, so far as the time at my disposal will allow, and so far as the materials are at present ripe for the historian, I venture to ask your further indulgence for a few brief moments whilst passing from the region of fact to that of inference.

That the Kent's Hole men of the Hyænine period—to say nothing at present of their predecessors of the Breccia—belonged to the Pleistocene times of the biologist, is seen in the fact that they were contemporary with mammals peculiar to and characteristic of those times. This contemporaneity proves them to have belonged to the *Palæolithic* era of Britain and Western Europe generally, as defined by the archaeologist; and this is fully confirmed by their unpolished tools of flint and chert. That they were prior to the deposition of even the oldest part of the peat

bogs of Denmark, with their successive layers of beech, pedunculated oak, sessile oak, and Scotch fir, we learn from the facts that even the lowest zone of the bogs has yielded no bones of mammals but those of recent species, and no tools but those of *Neolithic* type; whilst even the granular stalagmite, the uppermost of the Hyænine beds in Kent's Hole, has afforded relics of mammoth, *Rhinoceros tichorhinus*, Cave Bear, and Cave Hyæna.

That the men of the Cave Breccia, or Ursine period, to whom we now turn, were of still higher antiquity, is obvious from the geological position of their industrial remains. That the two races of *Troglodytes* were separated by a wide interval of time we learn from the sheet of crystalline stalagmite, sometimes 12 feet thick, laid down after the deposition of the breccia had ceased, and before the introduction of the cave-earth had begun, as well as from the entire change in the materials composing the two deposits. But, perhaps, the fact which most emphatically indicates the chronological value of this interval is the difference in the faunas. In the cave-earth, as already stated, the remains of the Hyæna greatly exceed in number those of any other mammal; and it may be added that he is also disclosed by almost every relic of his contemporaries—their jaws have, through his agency, lost their condyles and lower borders; their bones are fractured after a fashion known by experiment to be his; and the splinters into which they are broken are deeply scored with his teeth-marks. His presence is also attested by the abundance of his droppings in every branch of the cavern. In short, Kent's Hole was one of his *homes*; he dragged hither, piecemeal, such animals as he found dead near it; and the well-known habits of his representatives of our day have led us to expect all this from him. When, however, we turn to the breccia, a very different spectacle awaits us. We meet with no trace whatever of his presence, not a single relic of his skeleton, not a bone on which he has operated, not a coprolite to mark as much as a visit. Can it be doubted that had he then occupied our country he would have taken up his abode in our cavern? Need we hesitate to regard this entire absence of all traces of so decided a cave-dweller as a proof that he had not yet made his advent in Britain? Are we not compelled to believe that Man formed part of the Devonshire fauna long before the Hyæna did? Is there any method of escaping the conclusion that between the era of the Breccia and that of the Cave-earth it

was possible for the Hyæna to reach Britain?—in other words, that the last continental state of our country occurred during that interval? I confess that, in the present state of the evidence, I see no escape; and that the conclusion thus forced on me compels me to believe also that the earliest men of Kent's Hole were *interglacial*, if not *preglacial*.

—o—

OCCASIONAL NOTES.

ON THE ABSENCE OF THE WEASEL FROM IRELAND.—As no Irish-killed specimen of the true Weasel is to be seen in any of the public Museums, nor any authentic record of its capture in Ireland, it is much to be regretted that Mr. Mahoney, who states in 'The Zoologist' for July (p. 290) that it occurs in Donegal, did not send you a skin, or better still a specimen in the flesh. It is also to be regretted that Mr. Borrer did not shoot the specimen he saw hunting about a stone wall near Currawn, in the Island of Achill, last November. However, it appears to me that both gentlemen may have been mistaken, and that what they took to be Weasels were either young or very small female Stoats, which had either moulted or in some other way lost the black tip of the tail, and thus bore some resemblance to Weasels. The late William Thompson, of Belfast, during the many years in which he was investigating the Natural History of Ireland, never met with the Weasel, nor did he ever receive a specimen from any of his numerous correspondents in nearly every county in Ireland. I well remember asking him if he thought it possible it might yet be discovered as a native, but his reply was that he was very doubtful on the subject. Dr. Carte, who has been for many years Director of the Royal Dublin Society's Museum, never met with a specimen, nor is there one in that Museum. Again, in the South, Dr. Harvey, of Cork, a naturalist of great practical experience, has never met with, nor been able to obtain for his fine collection of our native fauna, an Irish-killed specimen of the Weasel. In a letter which I received from him a few days ago he says:—"I never saw the Weasel in Ireland, and I don't believe we have it. I have had over and over again to prove to people that what they thought to be Weasels were in reality Stoats. So, like yourself, I have still to look for the pleasure of beholding an Irish Weasel." Such being the experience of Thompson in the North, Dr. Carte in the East, and Dr. Harvey in the South of Ireland, there seems very little chance of this animal being found to be a native of Ireland.—ROBERT WARREN (Moyleview, Ballina).

BRITISH-KILLED PURPLE GALLINULES.—In 'The Zoologist' for August (p. 339) my friend, the Rev. Murray A. Mathew renews his defence of

the Somersetshire and other British-taken Purple Gallinules, *Porphyrio veterum*, against the imputation of being escaped birds and not *bonâ fide* wild visitants to our islands. From my experience of the habits of this species as observed in Spain and Sicily, it seems to me that he is arguing upon erroneous premises, especially as regards its assumed "migratory" instincts. When he says, " Bearing in mind that the birds are migratory, and that the mouth of the Rhone or the coast of Portugal is at no great distance from this country when fairly on the wing," &c., he is doubtless mindful of the exact words of the late M. Favier, and of Colonel Irby, in the 'Ornithology of the Straits of Gibraltar,' but I imagine that both of them use the expression in a far more limited sense than that in which Mr. Mathew has taken it. From the neighbourhood of Gibraltar, where it occurs in January and February, "doubtless on migration" to several marshes where it is resident throughout the year, is but a few miles, and there is a succession of these as far as the great marshes of the Guadalquivir, which are only seventy miles in a straight line from Gibraltar: whilst from the South of Portugal to Bath or Wells it is thirteen degrees of latitude, as the crow flies, or nearly eight hundred geographical miles! Mr. Mathew may consider this "no great distance for a bird when fairly on the wing," but there are birds, and birds, and the Purple Waterhen is one of those most difficult to flush, and settles down as soon as possible after a short flight, seldom, if ever, to be flushed again. If a dog has almost got hold of one, it must perforce rise or be "chopped"; but when, after a short flight, it drops down into the sedge, it runs and clammers amongst the reeds, and is seen no more. It would take twenty couple of otter-hounds to thoroughly rout up a marsh of moderate dimensions so as to give any idea of the Porphyrios it might contain; and after working a couple of those marshes the staunchest pack would be pretty well "baked." Again, it will be observed that even its occurrence "on migration" near Gibraltar is in the months of January and February, the very time at which the officers of the garrison and other sportsmen are in the habit of going out shooting, and consequently many a bird might be seen at that time which at others might pass unnoticed; besides which in winter the cover is not so dense. If the bird were really "migratory," in the usual acceptation of the word, it is strange that it should have become scarce or almost extinct in the marshes of the Albufera of Valencia, in those near Murcia, in those of the Prat and the Almenasa, of the Island of Majorca, and other localities. That it is "more abundant in winter," as Von Homeyer says, merely shows that there are naturally more sportsmen about at that season, and that, the sedge being scantier, it is then more easily obtained. My impression, in fact, is that there are few birds which migrate less and are more locally restricted than this species. Nor can I agree to Mr. Mathew's assumption that any one of the captured specimens

was proved to be a wild and genuine migrant because its plumage showed no signs of confinement, for the Purple Gallinule is one of those species which would least show marks of captivity, and to which much greater space and freedom are accorded than to many others. Even were this not the case, I can recall to memory many instances of birds in confinement in perfect plumage; and to cite but one, I may mention a young Golden Eagle taken from the nest on the 4th May, and killed, in default of a purchaser, by one of my Spanish collectors, in September, in which nearly every feather is like satin—a beauty never approached by any wild bird I ever saw, and I think the experience of my friend Mr. E. Hargitt, who now possesses it, will confirm mine. As for escaping from an enclosure, or anything short of an absolute cage, few birds could do so with greater facility, for this Gallinule can climb like a cat, whilst its skulking habits might enable it to remain unnoticed till all traces, if any, of captivity had passed away, and even till the clipped feathers in one wing had been replaced by new ones. To sum up, it seems to me that there are few European species less likely to have come to England of their own accord than the Purple Gallinule; but I will give Mr. Mathew the benefit of a suggestion as to the origin of the individual captured in Somersetshire. It is well known that the Romans kept these birds in captivity: they may have brought some to Britain. Bath was a Roman colony, and the court-yard of some Pro-consul of *Æquæ-salis* may have been enlivened with the imperial purple hues of this beautiful southern species. When the Roman power waned and "the heathen" poured across the Severn, necessitating those "great battles in the west" of which our Laureate has sung, the neglected Gallinules would naturally seek refuge, and also food (for probably at such times their owners forgot to feed them), in the peaceful marshes of the Parrett. Increase of population and drainage would in later times have diminished their numbers, and in the bird in question we have *perhaps* the last descendant of the original invaders, which, after 1400 years of occupation by its "forbears," may fairly lay claim to naturalization. On this supposition, and on this only, I should be inclined to admit that it has a claim to be considered a "British" bird.—HOWARD SAUNDERS (7, Radnor Place, Hyde Park, W.).

PURPLE GALLINULE IN LANCASHIRE.—Since the discussion in 'The Zoologist,' as to whether it is possible that a Purple Gallinule found at large in this country may or may not be a *bonâ fide* visitor and not an escaped bird, I have made further enquiries with reference to the specimen shot on the 25th September, 1876, at Grange-over-Sands, North Lancashire, to which you allude in the May number of 'The Zoologist' (p. 228). Allan, the gamekeeper, who shot it, tells me that he saw it frequently for a month previously to any attempt on his part to shoot it. Generally it was in company with a large covey of Partridges, feeding on the stubbles, and

when disturbed it invariably made for a large bed of reeds. On the first occasion of his seeing it, it ran some distance and then took flight across two fields into this bed of reeds, which is in reality a portion of the deserted channel of the River Winster. On the day on which it was shot it rose very wild from the reeds (some fifty yards off), and was brought down by a single pellet through the head. I may add that the *locus in quo* is close to the shore of Morecambe Bay. The bird was most minutely examined both by the birdstuffer and Allan, and they both tell me it presented no signs whatever of confinement, the feathers being sound and glossy and the legs perfectly free from any mark. When I saw the bird it was already stuffed and mounted, so that I could form no opinion of my own on the point.—EDWARD T. BALDWIN (Woodcroft, Ulverston).

BIRDS OBSERVED IN GLEN SPEAN.—The Golden Eagle breeds on Ben Aonoch More, the next mountain east of Ben Nevis, and but 400 feet lower. From Ben e Bhean (pronounced "Vahn"), a few feet lower and still more east, I have watched the magnificent flight of this king of birds, and have seen it wheel round over my head so near that I could distinguish its eye, then glide away in a straight line till lost to sight, without apparently moving a feather, but seeming to go at will on outstretched pinions in any direction it chose. On the latter mountain I have seen several pairs of Snow Buntings, *Plectrophanes nivalis*, in July, and listened to their song whilst smoking a pipe, in company with Mr. Howard Birchall, at the foot of the cairn on the summit, near which is a vast heap of quartz-stones of all sizes and shapes, and bad to walk on, which—but for the impossibility of the thing—have the appearance of having been dropped from carts over some acres of nearly level table-land. Amongst these stones, no doubt, these pretty birds breed, but I did not succeed in finding their nests. At the foot of this mountain, near the River Spean, the Woodcock breeds. Ptarmigan frequent the stony parts on all these mountains, and Red Grouse abound in the moors. Below Roy Bridge Black Grouse are plentiful on the south side of the river. In the low, wooded and cultivated parts of the valley the Blackbird, Song Thrush, Cuckoo, Chaffinch, Yellow Bunting, House Martin, Sky Lark, Titlark (*Anthus pratensis*), Rock Pipit, and Redstart are to be met with. On the banks of the streams that feed the Spean numbers of Common Sandpipers breed. On the marshy ground near the river the Redshank and Snipe, and on the banks of the river many pairs of Oystercatchers also breed; and last year, on a gravel-bed in the middle of the river, twenty-three miles from the sea, I took a nest containing three eggs of the Herring Gull, *Larus argentatus*. I ascertained with certainty that there was no mistake about this, by the aid of a telescope, as the pair of birds stood on the sand at the side of the river, a few hundred yards from the nest. On islands in Loch Laggan, as well as sometimes on the shore of the Loch, the Common Gull breeds. I took about a score of eggs and

a pair of young birds of this species last summer on one small island. The Redbreasted Merganser and the Wild Duck also nest on the shores of the Loch. On the moors I have seen the Golden Plover, Peewit, Curlew, Dunlin, and in rocky places the Ring Ouzel, which breeds here, making its nest sometimes on the ground, as does the Blackbird. On all the mountain streams the Dipper is numerous, and on the ridges of Oreag Meaghaidh (pronounced "Maige") I last year saw a Dotterel, *Charadrius morinellus*, with young ones, one of which I caught, but it was so extremely beautiful that I could not find it in my heart to kill it, although a specimen would have been worth securing. The first time I ascended this grand mountain (about 3700 feet above the sea), on the summit, a Sea Eagle, *Haliaëtus albicilla*, flew past me, and in following to see where it went I found the most remarkable rock I know of, where the nest then was; but two or three years since some one shot the female bird, and since then there has been no nest. The rock is, at a guess, 1000 feet high, rising from the bottom of the gorge called Corry Arder, 100 feet wide at the part joining the mountain and 30 feet wide at the part farthest from the mountain. It juts out into the gorge perhaps 500 feet. A more secure place for an Eagle's eyrie could scarcely be found. A little to the west of it is a rock face, about the same height, and a quarter of a mile long, nearly perpendicular, which forms the head of the corry, and between these rocks the snow drifts to a great depth, and the stream from the top finds its way down to Loch Arder under the snow, forming an archway down which a man may creep to the bottom. At the base of the rock is Loch Arder, a small lake swarming with trout. My son and I one day caught six dozen with artificial flies in about two hours, pulling them out frequently three at a time. Between this mountain and Ben Tulloch runs a stream called the Altooma, in which the Dipper delights to sport, and before it reaches the coach-road from Fort William to Kingussie it makes three magnificent falls, the lower one being nearly equal in beauty to the celebrated falls of Foyers. These wonders are not mentioned in any guide-book, and few if any tourists ever visit them. The Raven and the Hooded Crow breed on Oreag Meaghaidh, and the Heron may be seen on all the lakes in and near the Glen. Having spent only two or three weeks each summer for several years in this Glen since 1866, I may not have noticed all the birds that frequent it, but the absence of the House Sparrow is very remarkable. I feel sure a species of Owl lives near my sugaring-ground, for several times when out moth-hunting my hair has been made to stand on end by an unearthly noise which nothing but an Owl could have made.—NICHOLAS COOKE (Gorsey Hey, Liscard, near Birkenhead).

OCCURRENCE OF THE STOCK DOVE IN IRELAND.—I have to report the occurrence here of the Stock Dove, a bird of this year beginning its first moult having been shot here,—on the borders of Armagh and Louth,—on

the 12th August. I saw a pair of these birds here last summer. They were nesting in the crevice of a rock on a hill-side covered with heath, at an elevation of about 800 feet above sea-level, and brought out their young. The keeper had observed a pair of pigeons every year in the same quarter, breeding, and reported them to me, but until now did not succeed in shooting a specimen, and neither he nor I could get near enough to determine whether they were Blue Rocks or Stock Doves. Taking this report in connection with the first known occurrence of the species in Ireland in October, 1875, in the County of Down, which I had the honour to report to 'The Zoologist' soon after (February, 1876, p. 4798), and with another in the same county last June, which I believe Mr. Darragh, of Belfast, has already communicated to you, it does appear probable that the extension of the Stock Dove northward in England within the last ten years, as chronicled in the columns of 'The Zoologist,' has led to its further extension across the narrow channel, to the north-eastern parts of this island.—CLERMONT (Ravensdale Park, Newry).

[The occurrence of the Stock Dove in Ireland is very noteworthy, as until within the last three years it was quite unknown there. A specimen was shot last year in the Co. Down, and presented by Mr. A. O'D. Taylor to the Belfast Museum. During the present summer, as we learn from Mr. Darragh, a pair bred near Comber, in the same county, and a young one, shot after it had left the nest, was obtained by him also for the Belfast Museum.—ED.]

IMITATIVE POWERS OF THE WHINCHAT.—On the 15th May last, as my brother and I were taking a walk in the fields near Wilsden, we observed a Whinchat, *Saxicola rubetra*, fly from a wall into an oak tree a little in advance of us. When within about forty yards from the tree we sat down, and my brother called my attention to its singing. To my surprise, it was imitating the song of other birds. During the short time we listened, it imitated in quick succession the song of the Wren, Song Thrush, Chaffinch, Corn Bunting, Tree Lark, Greensfinch, and Starling so successfully that the most practised ear could scarcely have detected the difference. I remarked it again on May 17th; but a swollen stream separating me from the white-thorn in which it was singing, I heard it to great disadvantage. I could hear, however, a few strains which resembled the song of a Linnet, the two shrill call-notes of the Yellow Wagtail, and a note, which it kept repeating, very much after the manner of a Cole Tit. There was no mistake as to the identity of the species in question.—E. P. P. BUTTERFIELD (Wilsden, near Bradford).

ORNITHOLOGICAL NOTES FROM DORSETSHIRE.—With reference to the Cormorant of unusual plumage, referred to in 'The Zoologist' for July (p. 280), as seen by Mr. Gatcombe at Wembury, and the same or a similar one by Mr. Clogg on the Cornish coast, I think it probable I saw the bird

in Swanage Bay on June 23rd. My attention was attracted to a bird approaching me whose flight resembled that of a Cormorant with a Gannet's plumage; it fortunately passed within fifty yards of me, and I had no difficulty in identifying it. That it was a Cormorant I have no doubt, and corresponded with Mr. Gatcombe's account of the Wembury bird, with this difference—the wings and body appeared to be the normal colour of the species, rather than "silvery gray." The difference might only have been, through optical delusion, caused by reflection, the sky at the time I saw it being clear and unclouded. If it is the same bird, and seen in three successive counties, it must be making a tour of the English coast, and by practical experience finding the most favoured spots to satisfy its voracious appetite. Two colonies of Black-headed Gulls have established themselves on lakes between Poole and Studland. At one of these lakes Pochards have bred for the last three years. In the spring of 1875, a male Pochard, incapacitated from accompanying his companions northwards by a fractured wing, was fortunate enough to induce a female to remain with him, and a brood of young red-heads appeared on the lake, which was so carefully and successfully watched that the following year (1876) three broods were hatched. Having only just returned after a long absence from home, I have been unable to assure myself of the progress made in the further propagation of this bird. My friend Mr. W. M. Calcraft writes me word that a few weeks since he observed a hawk (a Peregrine probably) swoop down upon a Black-headed Gull on the wing, but failing to capture the bird he quickly returned and took it up as it floated on the water, and alighted on the ground a short distance off, with the intention of making a repast on the remains, but on the approach of Mr. Calcraft he flew away, leaving the gull in his possession. Curlews have bred this season on the heaths between Poole and Wareham. An egg of this bird was sent me last April, containing a chick just ready to enter upon subaërial life: its length was four inches; bill, three-quarters of an inch. Choughs and Ravens have returned to their old nesting-places on the rugged coast of Purbeck, after extermination before the passing of the Wild Birds Preservation Acts. The Peregrine breeds in Gadcliff (the noble headland on the western side of the so-called "island"), which is happily so steep and precipitous that no human hand can rob it of its young, although it not unfrequently falls to the gun or trap of the inexorable gamekeeper.—J. C. MANSELL-PLEYDELL (Long-thorns, Blandford).

BREEDING OF THE POCHARD AND BLACK-HEADED GULL IN DORSETSHIRE.
—In the early part of June, I was informed that there were some curious birds breeding at a pool well known as a favourite resort of wild fowl in this vicinity, and that the keeper had never seen any like them there before. So one fine morning I got on board a sailing-boat, and ran down the harbour to the point of land nearest to the pool. From here a short walk

leads one to the brow of a small hill looking out over the waters of the English Channel. The sheet of water I purposed visiting lies between this hill and the sea, separated from it only by a low line of sand-hills, and in one place by a flat plain which in gales of wind is completely inundated. At a glance one could see what a place it naturally is for wild fowl. A wide piece of water in the middle, the south-west end being closed in by a large and very thick reed-bed, the other extremity tapering off into a long series of narrow ponds and bogs,—something like Slapton on a smaller scale, but with the advantage of having a large mud estuary at its back, and of being in a more retired position,—having no roads near it, to say nothing of “Sand Hotels,” the only habitations being an old hulk drawn up on the beach for the coast-guard, and a deserted and ruinous cottage which has sheltered many a wild-fowler, with his death-dealing punt-gun and almost invisible punt close by, among the rushes within a few yards of the door. I walked down across the rough heath and furze to the edge of the pond to meet the keeper, who was rowing across in a canoe. Getting in this we started to visit the strange birds. As we went along, I questioned the man as to Ducks, &c., breeding, of which there were plenty, as well as Teal, although I did not see any of the latter. Coots, Moorhens and Dabchicks we saw in numbers; and, what is much more interesting to ornithologists, about thirty Pochards had been hatched out there this year, but the eels or other fish had destroyed the greater part of them. We were now approaching a long outstretching rushy point, which divided off the broad sheet of water from the ponds—a place much appreciated by the Coot-shooter. At the end of this point were several small rushy islands, and these had been selected for the breeding place of a party of Black-headed Gulls; and this bird it was that had puzzled the keeper. He did not think it could be “a Gull, as it was so small and had a black head.” I told him not to disturb them, as they would do no injury, and were a great addition to the charm of that lonely sheet of water, which, without its bird-life, would serve one’s mind to look back upon as an image of desolation. On returning from the Gulls’ nests, one of which contained a young bird—the colony consisting of about seven pairs—I expressed a desire to see the young Pochards. The keeper said there were little lots of them in several places, and that one in particular used a small pool called the “little black pool” at the extreme end of the pond. We paddled slowly up through the winding rush-bordered lanes of water connecting the ponds, through the “big black pool,” much loved by the Pochards in winter for its abundance of weed. Here it was that some years ago above eighty of these birds were killed by the discharge of two punt-guns, one fired at them on the water, the other just as they were getting on wing—the best chance for killing this sort of bird, as their feathers are then more open, and they give plenty of time while “skittering” before they can get their plump bodies well into the air. At the end of the

little black pool, I discovered the birds we were in search of. They seemed not the least alarmed at our presence, being, I suppose, accustomed to the keeper's boat. They swam rapidly along within ten yards of us, the old bird and three young. There had been five, but something had destroyed them; the keeper blamed the big eels, of which there are quantities in the pond. I left the man here, landing close by the old cottage, and walked across the heath down towards the harbour. About thirty Curlews got up from the top of the hill as I came up over the brow. The keeper had previously informed me of their breeding in the vicinity of the pond. As I got within a quarter of a mile of the beach my attention was attracted by some small white object running rapidly along the turf, which had been cut for peat. I soon made it out to be a Ringed Plover, and after a little search discovered its four eggs, in a very poor apology for a nest, on the bare turf at least three hundred yards from the water. I came out upon the shore close to a long tongue of gravel, the end of which was absolutely covered with birds, of two kinds only—Herring Gulls and Cormorants. As I approached the Gulls flew off, while the Shags walked slowly into the water, swam across a small creek and waddled out on the mud, with a look of lazy unconcern, which was justified by the extreme heat of the day. A pair of Oystercatchers, with their shrill cries and prettily contrasted plumage, accompanied me on my walk back to the boat, while a handsome-looking Shielddrake, whose nest was probably in one of the numerous rabbit-holes near the beach, flew uneasily round my head, and was no doubt relieved to see the brown sail of our una-boat hoisted to a favourable breeze.—T. M. PIKE (Westport, Wareham).

RING OUZEL NESTING NEAR MALVERN.—This bird has nested on the North Hills this summer, and has succeeded in rearing its young. On two other occasions the Ring Ouzel has nested on the hills, but in both cases a mishap prevented the hatching.—ISAAC HARDING (10, Lansdown Crescent, Malvern).

SCARCITY OF THE CORN CRAKE IN THE WEST OF ENGLAND.—A few years since I wrote to 'The Field' on the almost complete disappearance of the Corn Crake in the West of England, where it used to be one of the commonest of our spring migrants. I was not led to do so from the phenomena of an exceptional season, but from the observation that year by year the Corn Crake was surely deserting us, and many meadows and clover fields which used to be vocal with its familiar "crake, crake" seemed destined to re-echo those sounds of spring no more. At Lundy Island Corn Crakes used to assemble in large numbers in September on their autumnal migration, and afforded good sport for a few days. The Rev. H. G. Heaven tells me that Corn Crakes are now rarely seen on that island. The last place where I came across these birds in any number in the West of England was Dartmoor, and here in August I found them on

the very wettest bogs. This year I have not heard the call of the Corn Crake once in West Somerset, and last year I only heard it twice. Probably the increased drainage of land has something to do with the scarcity of the bird. Its favourite food consists of small snails, and if through any cause the supply of these becomes diminished we need not wonder at the birds forsaking localities where they can no longer feed.—
MURRAY A. MATHEW (Bishop's Lydeard, Taunton).

MIGRATION OF ROOKS.—In 'The Zoologist' last year appeared some notes from Messrs. Stevenson, Cordeaux, and others on the migratory habits of Rooks (see vol. 1876, pp. 4776, 1837, 5105). Few people, perhaps, are aware that numbers of these birds arrive here from the north for the winter. When fishing and shooting in the North Sea during October, I have often met with large flocks of Rooks on their way to this country. It was seldom that they flew in straggling parties like the Gray Crows; those that were seen singly appearing to have fallen out from the ranks through fatigue. After a gale of wind from the south-west, I have seen several floating dead on the water between twenty and thirty miles off the land. I have also received a few wings from the light-ships off the east coast during the winter months, the birds having fallen disabled on deck after striking the lamps. From never having observed them on their return journey in the spring, or obtained any wings from the light-ships at that period, I am not sure whether they take up their residence in this country or again return to the North of Europe, from whence they appear to be making their way when met with in autumn.—
E. T. BOOTH (Dyke Road, Brighton).

CURIOS NESTING-PLACE FOR A HOUSE SPARROW.—An instance of a singular place chosen by the House Sparrow for nidification has come under my notice this year. The nest is built in a cavity formed by the left arm, and half-encircled by the drapery, of the statue erected in 1870 to the Earl of Carlisle, in that part of the Phoenix Park, Dublin, called the "People's Garden." The combined height of the statue and pedestal is fourteen feet six inches, and the place where the nest is constructed is about twelve or thirteen feet from the ground. It was very amusing to observe the saucy way in which the cock and hen were accustomed to perch on his lordship's robes of state before and after visiting the nest. The head gardener informs me that a pair of House Sparrows began to build in the same place the year after the erection of the statue, and that they have done so regularly every year since. He says that two broods have been successfully reared this year.—WILLIAM W. FLEMNG (18, Upper Fitzwilliam Street, Dublin).

SQUACCO HERON IN KING'S COUNTY.—We have received for preservation a beautiful specimen of the Squacco Heron, forwarded by Lord Carbery from Castle Bernard, King's County. The bird proved to be a female, and

in very good condition, the intestines being loaded with fat. The ovary contained eggs, some of them as large as BB shot. The stomach was filled with the wing-cases of small beetles and the remains of small caterpillars.—WILLIAMS & SON (2, Dame Street, Dublin).

[The Squacco Heron is a very rare bird in Ireland. Thompson, in his 'Natural History of Ireland' (vol. ii. p. 158), states that one was shot in Killeagh Bay, near Youghal, in May, 1849, and another, also obtained near Youghal, is preserved in the Royal Dublin Society's Museum. A third, shot at the mouth of the Laune river, County Kerry, on June 10th, 1875, will be found recorded in 'The Zoologist' for February last (p. 57). It is somewhat remarkable that these specimens, as well as a score of others procured in different parts of England, were nearly all obtained in the summer months. As a rule, the grallatorial birds which visit this country but do not breed here, come to us in spring and autumn. The Squacco Heron seems to be an irregular summer visitant.—ED.]

ODD MATERIALS IN A CORMORANT'S NEST.—Cormorants breed not only on high rocks and cliffs, but also at times on low islands, where their nests are elevated only a few feet above high-water mark. Amongst the sticks and other litter which they make use of for building, I have seen children's whips and spades, a gentleman's light cane, and part of the handle of a parasol, all of which I suppose the birds had picked up floating at sea.—E. T. BOOTH (Dyke Road, Brighton).

PIED FLYCATCHER NESTING NEAR MALVERN.—This beautiful little bird has been seen in and around Malvern on several occasions during the present summer. A pair nested at the Rhidd, but fell victims to the raids of the village lads. Another pair is evidently intending to nest, and is being closely watched by Mr. Edwards, a local naturalist. With the exception of one in my possession, shot two years since, I am not aware that there has been a recorded appearance of the Pied Flycatcher in this part of Worcestershire before.—ISAAC HARDING (10, Lansdown Crescent, Malvern).

BARTRAM'S SANDPIPER IN SOMERSETSHIRE.—In the collection of birds belonging to Dr. Woodforde, of Amberd House, near Taunton, and chiefly obtained in the county of Somerset, is a very perfect example of Bartram's Sandpiper, which was shot at least thirty years ago on the banks of the River Parret, in the parish of Combwich. It was shot in one of the winter months, and appears to be in complete winter plumage, being more ashy in its coloration than any other example of this Sandpiper which I have seen. So far as I am aware, this specimen has not hitherto been recorded.—MURRAY A. MATHEW (Bishop's Lydeard, Taunton).

OSPREY NEAR BRIDLINGTON.—On June 30th an Osprey was captured near here, at a place called Gransmoor, the property of Mr. Robert Medforth. It was found by his keeper caught in a pole-trap by one claw, and

was not at all injured. It had been seen for five or six months previously in that neighbourhood hawking about a trout-stream. It is now in confinement, and seems to be doing well.—J. H. HUTCHINSON (Bridlington).

HABITS OF THE GREAT PIPE-FISH.—In a glass vase in the east saloon of the Royal Aquarium, Westminster, is a fine brood of the Great Pipe-fish, *Syngnathus acus*, recently developed there, affording a good opportunity for observing a portion of the economy of this curious animal. The parent of these little strangers (the male) was received some weeks ago, and on arrival it was observed to carry ova, which had been previously transferred to its "pouch" by a female, before captivity. How long the ova had been thus carried I am unable to state, but they then appeared to be in an early stage of development, for they visibly enlarged in the pouch, causing it to distend very considerably. As most naturalists know, this curious transference of the eggs from the female to a pouch-like process of the male is a part of the life-history of this species. It has not yet been satisfactorily decided how long the ova are carried by the males, but that it is for some time has been proved in this instance; for the actual separation of the young from the parent occurred at least seven weeks after the arrival of the latter in this Aquarium. I cannot corroborate the statement of some authors that the young, on alarm, return to the pouch of the male for safety. On this occasion the young seemed, immediately after birth, to disperse in any direction over the tank in which they were confined. This being a large one, some of them were at times several yards distant from the parent, which, when touched, simply looked after its own safety, and the young had to take care of themselves. These little *Syngnathi* are now (July 4th) about three weeks old, and are an inch and three-eighths long, having grown double their own length in about fourteen days. They are feeding well upon minute organisms, which they find amongst the vegetation growing in the vase. I have every reason to expect rearing them to maturity, which will be a matter of great interest, for I am right, I believe, in stating that this is the first instance of the development of the young of this species in a public Aquarium.—JOHN T. CARRINGTON, (Naturalist and Curator Royal Aquarium, Westminster).

LONG-LEGGED SPIDER CRAB AT PENZANCE.—I have taken in my trammel here a specimen of the Long-legged Spider Crab, *Stenorhynchus phalangium*, having conspicuously the small single bristle at the apex of the eye, noted by Prof. Bell. It is stated by him to be common, but that is not my experience of it in Mount's Bay. I have neither taken nor seen a specimen of it for several years.—THOMAS CORNISH (Penzance).

CORRECTION OF ERROR.—In the reports of the Linnean Society in our August number a few misprints have accidentally crept in, for which the reporter is not responsible, as no proof for correction was sent him. Adopting the official routine, the printer also added "Secretary" to the

writer's signature without warrant, and this unfortunately passed through press, escaping our notice.—ED.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

August 1, 1877.—J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the chair.

Mr. Stevens exhibited specimens of *Teretrius picipes* (Fab.), one of the *Histeridae*, which he had taken on the same fence, at Norwood, on which he had previously taken *Tillus unifasciatus*. He also remarked on the appearance in his neighbourhood of a second brood of *Colias Edusa*, several specimens having been observed by him, all of which were males.

Mr. Smith exhibited, on behalf of Dr. Bennett, of Sydney, who was present at the meeting, a fine pair of the beautiful and rare beetle *Eupholus Bennettii* (Gestro), from Yule Island, New Guinea. It had been described under that name in the 'Annali di Museo Civico di Genova,' viii. 1876.

The Secretary exhibited a specimen of an insect which had been forwarded to him by Mr. Bewicke Blackburn, who stated that a large field of mangolds belonging to the Knight of Kerry, in the Island of Valentia, had been totally destroyed by it. The specimen was examined by several of the members, who agreed that it was the larva of a Coleopterous insect, but in consequence of its imperfect condition it could not be determined.

Mr. Douglas, who was unable to be present at the meeting, had forwarded to Mr. Jenner Weir a letter he had received from Mr. R. A. Ogilvie, enclosing specimens of an insect found in great quantities in a jar of pickles (piccalilly). They confined their attacks to the pieces of cauliflower in the jar, which they appeared to relish, notwithstanding the vinegar, mustard, pepper, &c., in the pickles. The specimens had been submitted to Professor Westwood, who replied that "the flies were the common *Drosophila cellaris*, with their curious two-horned pupæ; and they frequent cellars and cupboards, delighting in stale beer, wine, &c." He supposed that "the cauliflower was more to their taste than the other things in the jar, being more succulent and flabby." In answer to a question put by Mr. Ogilvie, he said that the eggs were laid in the pickle-jar, and not in the vegetables before they were pickled.

Mr. Douglas also forwarded a letter he had received from Mr. A. H. Swinton, of Guildford, enclosing a specimen of *Myrmica ruginodis*, which, on being placed under a wine-glass, stationed itself at the rim, head downwards, and rapidly vibrating the abdomen, continued "an intense noise," resembling the spiracular piping of the Dipteron, *Syrilla pipiens*.

Mr. Enock remarked, with reference to a spider which had been exhibited by Sir Sidney Saunders at a previous meeting as *Atypus Sulzeri*, that he had taken the specimen himself at Hampstead, and that he had since referred it to the Rev. O. Pickard-Cambridge, who stated that the insect was certainly not *A. Sulzeri*, but that he considered it to be *A. Beckii* (Cambridge), which would probably be found to be the same as *A. piecus* (Thorell), though he was not certain, as the only female which he had of that species was too much damaged to admit of any satisfactory comparison. The type of *A. Beckii* was an adult male given to him by the late Richard Beck, who was uncertain of the locality, though Mr. Cambridge appeared to think it probable that he had got it from Hampstead, as he often collected there. The example sent to him by Mr. Enock was different from the Isle of Wight species, of which he had several female specimens, but no males, though he believed them to be *A. Sulzeri*. He would be very glad if collectors in the Hampstead locality would look out for the males in the autumn and winter, as if he could obtain that sex it would enable him to put the question, as to species, at rest.

Mr. Enock exhibited a bottle containing a great number of larvæ of *Cossus ligniperda*, which he had found in a portion of a small willow. He had taken fifty-six larvæ out of a piece of wood four feet long.

Mr. Dunning again directed the attention of members to the exhibition by Mr. Jenner Weir, at the last meeting, of a female specimen of *Cicada montana*, which was reported to have been distinctly heard to stridulate, notwithstanding that the insect was a female, and also that the species was one of which even the males were not previously known to stridulate. Mr. Weir stated that since the last meeting he had again been to the New Forest, and had seen, in the possession of Mr. James Gulliver, of Ramnor, near Brockenhurst, two specimens of *Cicada montana*, and he was assured by Mr. Gulliver that the stridulation of the insect was well known to him, and that he was guided by the sound so made in effecting the capture. Mr. Champion said that he himself had captured the insect, and had distinctly heard a loud buzzing noise, but whether the sound was caused by the males or females he could not say. Mr. Dunning considered that further evidence was wanting to prove stridulation in the females.

A paper was read by Mr. W. F. Kirby, entitled "Notes on the new or rare *Sphingidæ* in the Museum of the Royal Dublin Society; with remarks on Mr. Butler's recent Revision of the Family."

Papers were also communicated, by Mr. J. S. Baly, on "Descriptions of new Genera and Species of *Cryptocephalidae*," and by the Rev. H. Gorham—"Descriptions of new Species of *Cleridae*."

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THE BIRDS OF THE BERMUDAS.

BY LIEUT. REID, R.E., F.Z.S.*

IN March, 1874, when ordered to the Bermudas to complete my tour of foreign service, I made diligent and most anxious enquiries about the birds likely to be found there, and I must say the answers I got from brother officers and others who were familiar with the islands were anything but satisfactory in an ornithological point of view. I was informed that birds were few and far between, with the exception of one or two common resident species, and a casual flock of plovers or waders in the autumn months. My ardour cooled to zero abruptly. I looked forward to the red, blue, black, and white birds of my informants, and the uncertain and erratic Plover, with a sigh of despair! Should I take a gun at all, to lie idle in the damp corrosive climate to which I was bound?

However, on board the good ship 'Severn'—a hired transport, which conveyed the company of Royal Engineers, to which I then belonged, across the Atlantic—I found some officers of H.M. 53rd Regiment returning to Bermuda from leave in England, one of whom (Capt. Rooke) was a great sportsman, and had shot and collected some birds during his previous residence in the "beautiful isle of the sea." His account was decidedly reassuring. He spoke of twenty or more species, and delighted my ears with the magic words—"Teal" and "Snipe." I was thankful then that my trusty

* These notes on the Ornithology of the Bermudas were originally published in ten different numbers of 'The Field,' in July, August, and September, 1875. They are now reprinted, with corrections and numerous additions by Lieut. H. Denison, R.E., F.Z.S., who has kindly assisted the author in revising them.

16-bore was lying snug and safe in my cabin, ready to add to the Bermuda lists when called upon.

We left Gibraltar on the 12th, but did not land in Bermuda till March 30th, owing to a pleasant head-wind and somewhat limited powers of locomotion. My note-book was started next day,—our first on shore,—and was religiously kept up from that time till June 3rd, 1875, when I left again for English soil.

In this brief sketch, and in face of the heading assigned to it, I must needs confine myself to the birds alone; and it would be out of place were I to attempt any description of the islands themselves, their inhabitants, scenery, or productions.

Situated in lat. $32^{\circ} 15'$ N., and long. $64^{\circ} 51'$ W., six hundred miles or more from the great North American continent, and exposed to the full force of ever-varying gales, the long, narrow group of islands known as the "Bermudas" offer a harbour of refuge to many a weary, storm-beaten migrant on its passage north or south, and in consequence we find a great many genera of the North American avi-fauna represented in the visiting list. On this subject my friend Mr. J. Matthew Jones, of the Middle Temple, editor of 'The Naturalist in Bermuda' (1859), remarks—"That the Bermudas afford an excellent position from whence to observe the annual migration of many species of the feathered tribes of America cannot be doubted. Equidistant, or nearly so, from the shores of Nova Scotia, the United States, and the West Indian archipelago, they present, as it were, a casual resting-place to many birds while traversing the broad expanse of ocean which forms the eastern limit of their great line of flight."

Some species, as the American Golden Plover, American Snipe, Sora Rail, Night Hawk, *Chordeiles virginianus*, Yellowshanks, &c., seldom fail to appear every autumn, and may be set down as regular visitors, probably from the fact that their line of migration is direct from the north-eastern coasts of the continent to the West Indies and tropical South America; but, as will presently be seen, the great bulk of the recorded species are irregular or accidental visitors, whose migratory journeys are less ambitious, and who are blown off the mainland by unfavourable winds. That fresh species will from time to time be added to the present list is more than probable; in fact, it is *possible* that the whole avi-fauna of North America may eventually be recorded as Bermudian. When such diminutive flyers as the Ruby-throated Humming-bird, *Trochilus*

colubris, and the Blue Yellow-backed Warbler, *Parula americana*, can find their way across six hundred miles of water in safety, where is the line to be drawn?

With the exception of a solitary example of the European Sky Lark, *Alauda arvensis*, obtained in 1850, the whole of the birds recorded in the Bermuda list are included in that of North America, and no species has as yet been discovered peculiar to the islands. This, if we accept the theory of the comparatively recent "Æolian" formation of the group, is not to be wondered at. At one time I actually had great hopes of establishing a real 'Midian' species, as I several times observed a small brown bird, remarkably shy and mouse-like in its habits, among the dense rushes and scrub of the larger swamps, and this I could not refer to any known North American form. I had a good view of one, too, close to me, one Sunday afternoon (*of course* it was on a Sunday, when I had no gun with me), and carefully took stock of the little fellow; but, as I never succeeded in procuring a specimen, I must perforce leave the question undecided, in the hope that someone may be more fortunate in this respect than myself.

Rejecting doubtful occurrences, one hundred and eighty-one species are known to have occurred in the Bermudas up to June 3rd, 1875. Since then two more species, *Certhia familiaris* and *Limosa hudsonica*, have been added. During the fourteen months I resided there, no less than seventy-nine species were recorded, sixty-eight of these by myself personally. I was only able, however, to obtain specimens of sixty-one of these, but that, of course, far exceeded my original expectations. The winter of 1874—75 was not exactly a favourable one for a collector, few violent storms occurring at critical times to drive the birds to the strange and unexpected shelter in mid-ocean. I worked hard,—as hard, that is to say, as my multifarious duties as an engineer officer would permit,—but many things were against me. In the first place, the peculiar elongated shape of the group of islands, and the long distances between the various swamps and "likely" places, to say nothing of the indifferent character of the roads, render it no easy task to "register" even a particular district in the course of an afternoon. The climate, too, except when the wind is from the north in winter time, is warm and damp, and much against a long struggle through the sage bush and scrubby cedars which clothe the hills, or over the rough steel-pointed rocks of the shore.

Then there is such an extent of cedar forest, dotted here and there with patches of highly-cultivated garden, that it is hard to find birds, or, when found, to follow them up. Mosquitoes are frightfully large and ferocious in summer and autumn, especially in and around the ponds and swamps. Many a time have I lost a long-expected shot by having to brush the little torments in dozens from my nose and eyes. And as to believing a word the good-natured coloured people tell you about the extraordinary birds they see, it is simply impossible.

But, in spite of these drawbacks, I enjoyed my ornithological labours vastly, and look back with pleasure not only to the successful stalk or lucky snap-shot which occasionally rewarded my exertions, but also to the numerous instructive hours I passed, field-glass in hand, in the deepest recesses of the swamps or on the open shore, watching the agile *Mniotilla varia* and the comical *Totanus solitarius*, or listening to the loud musical "chip" of *Seiurus noveboracensis*, and the harsh, grating cry of the Phaëtons.

In the following notes I have largely availed myself of those of Major Wedderburn (late 42nd Highlanders) and Mr. Hurdis (formerly Controller of Customs in the islands), which have already been given to the public in a little work, entitled 'The Naturalist in Bermuda,' to which I have already alluded; also of the collection of birds formed, during the last twenty-five years, by Mr. Bartram, of Stocks Point, near St. George's. I trust I may be held excused for the constant references to these sources of information, both by the gentlemen named and by the indulgent ornithological reader. Major Wedderburn and Mr. Hurdis compiled their valuable notes long before my time, as may be inferred from the date of the book mentioned (1859); and since their departure no one, except my friend Mr. J. M. Jones, appears to have kept any record of the bird-life of the islands—more's the pity. With Mr. Bartram, now an elderly man, I struck up a great friendship, and I spent many an afternoon poring over his birds. Of these I made out a catalogue for him, likely, I think, to defy the criticism of his ordinary visitors, though I cannot quite vouch for its accuracy on all points. The genus *Dendroëca* is truly a "caution," and several of Mr. Bartram's specimens, ancient and somewhat dilapidated, puzzled me sorely.

He has about one hundred and ten species of Bermuda birds, and many "outsiders" mixed up with them; but I was careful,

with his assistance, to reject all doubtful specimens in compiling the catalogue. An old soldier, settling at the expiration of his service on the picturesque promontory of Stocks Point, where he still resides, Mr. Bartram has added the study of Natural Science to that of farming; and, in addition to producing the best arrowroot in the place, he has a turn at Geology, Conchology, Ornithology, and several other "ologies;" writes on scientific subjects to the local papers; and smokes his pipe in his museum, monarch of all he surveys—a commendable example to the British army.

These, however, are not the only assistants, past or present, that I met with. My friend Col. Bland, R.E., an excellent ornithologist, though he was too much engrossed with the cares of the R.E. office to accompany me in many of my excursions, helped me much in my identifications, which his knowledge of Canadian forms greatly aided; while Mr. J. M. Jones, besides placing his note-book at my disposal, was always ready with a suggestion or kind word of encouragement. Lieut. Denison, R.E., my companion in many a bird-hunt in days gone by, arrived in Bermuda in January, 1875—too late, unfortunately, to take much part in my labours. On him falls the task of checking and "auditing" my accounts, of remedying numerous deficiencies, and of supplying much additional information during his eighteen months' "durance vile" in Bermuda.

To save confusion I have adopted the nomenclature of Dr. Coues, in his 'Key to North American Birds;' for, though I do not conscientiously endorse the same throughout, I feel impelled, by the force of modern subversive currents, to adhere to it.

Turdus migratorius, Red-breasted Thrush; Robin.—By no means common, but occasionally arrives singly or in small flocks, both on northward and southward migrations, especially the former. Specimens were obtained in February and March, 1850, and in March, 1855. One was sent to Mr. J. M. Jones on November 24th, 1871, when several others were seen. I saw one near Hungry Bay on October 29th, 1874; and Mr. Bartram obtained one at Stocks Point about the same time. The three last-named occurrences established the autumnal appearance of the species, which had not been recorded in former years. Like many other migrants, the "Robin" would seem to modify its habits considerably on finding itself in a strange country, and to become shy and retiring in

disposition. The bird I saw took up its quarters in a thick mangrove swamp, and remained there, or in some tall thick cedars hard by, for several days. An intelligent coloured boy in charge of cattle on an adjoining meadow, who really *does* know how to describe a bird, saw it frequently, and told me it was very wild and hard to get near. This is very unlike the "Robin" I have met with in Canada and the United States. It is a thonsand pities that this fine bird cannot be persuaded to stay and breed in Bermuda, and to add its music to that of the common resident species. Major Wedderburn mentions (Nat. in B., p. 27) that a portion of a small flock of unfortunates, which made their appearance in February, 1850, was spared, in the hope that they might be tempted to remain; but they all disappeared in a few weeks' time, not leaving a single straggler. [A male of this species was shot in Devonshire Swamp on November 27th, 1875.—H. D.]

Turdus mustelinus, Wood Thrush.—Only one appearance of this species is on record, *viz.*, in the autumn of 1849—a season also memorable in Bermuda annals for an extraordinary invasion of Swallows and Cuckoos which took place throughout the islands. Both Major Wedderburn and Mr. Hurdis obtained specimens of this Thrush, but Mr. Bartram was not so fortunate.

Turdus Swainsoni, Olive-backed Thrush.—This species also visited Bermuda in small numbers during the productive autumn of 1849, when a few were obtained. It has since occurred, at long intervals, in the autumn. Mr. Bartram's collection contains three specimens of various dates. On April 29th, 1875, I shot a fine male in Smith's Marsh, the only instance of its vernal appearance. The stomach contained four or five white grubs, and some fragments of marsh plants. [One was brought to me on September 22nd, 1875; and another, a male, was killed by a boy with a stick in Devonshire Swamp, and brought to me on February 19th, 1876.—H. D.]

Mimus carolinensis, Cat Bird, locally termed "Blackbird."—Resident and abundant; its harsh, mewing cry may be heard all the year round, relieved in spring by a weak but commendable roundelay. After a shower of rain in May or June the marshes appear literally alive with these sprightly birds, and a most agreeable concert takes place among the males, prolonged till dusk should the weather continue fine. On ordinary occasions during spring time they sing a good deal, but rain seems to delight them

beyond measure. They are at most times remarkably bold birds, and follow an intruder through the swamp or cedar grove, perching close to him and scolding most unmusically; but when a pair have a nest they are far more suspicious, and silently leave the neighbourhood of their home. The hen bird sits very close on her eggs, but when disturbed darts rapidly away, returning as quickly and noiselessly when danger is past. Nidification commences about the end of the first week in April, and again at the end of May, two broods being reared. The nest is a large clumsy structure, built of dry grasses, weeds, and twigs, lined with small rootlets. It is very often ornamented externally with rags, bits of paper, skeleton leaves, &c., according to the quaint fancy of the architect. The usual site is in a cedar branch or lemon tree, at from three to eight feet from the ground; but occasionally an ambitious pair will go a few feet higher. Eggs deep blue, with a greenish tinge, .92 in. by .68 in., usually four in number. Among the numerous nests I examined I found a considerable proportion to contain one egg much shorter and rounder than the other three. In one case this egg was almost a perfect sphere. There being but few grapes or wall fruits grown in Bermuda to attract these mischievous birds, they are not looked upon with the same disfavour as in the United States.

Saxicola oenanthe, Wheatear.—This bird, a waif and a stray from Europe, *videlicet* Greenland, to the American continent, has actually found its way to these remote islands. One was shot by an officer of the garrison, near the lighthouse, on October 5th, 1846; the tail, unfortunately, was the only portion preserved, but this was sent to the late Mr. Yarrell, who confirmed its identity. Another was seen frequently by Col. Drummond and Major Wedderburn, near St. George's, in March, 1850, but baffled all their attempts to obtain it. Whether these two examples came direct from Greenland, or were blown off the American coast, is an inscrutable mystery.

Sialia sialis, Eastern Blue Bird.—Resident, and very common. It is also migratory, arriving in small flocks after heavy gales in the winter months. Major Wedderburn observed them in large flocks at Ireland Island on January 5th, 1848; and my friend Mr. J. M. Jones records their appearance in smaller bands in the Novembers of 1866 and 1871. I have frequently noticed a sudden increase in the numbers of this species in winter, but the visitors appear to

leave again in the early spring, taking with them doubtless some of their 'Midian brethren, for no perceptible accession of strength is apparent during the ensuing summer. This is, to my mind, the most delightful of birds, and certainly the flower of the limited flock of Bermuda residents; its brilliant plumage, vivacious manners, and pleasant warble, render it an object of interest to all; while its confiding and fearless nature in the breeding season, and the number of noxious insects it destroys, cause it to be strictly protected throughout the islands. The male bird in spring, when the sun's rays illumine his dazzling blue plumage, is perfectly lovely: he flashes across the road like a ray of azure light, and seems actually to blaze with intense colour from among the sombre foliage of the cedars. His spouse is far more sober in her attire; but she too puts on nuptial attire and looks uncommonly smart in April and May, when she acquires an unusually vivid blue, and much suffusion of reddish brown about the head. I accidentally shot one in this plumage one afternoon, thinking it was a stranger, so much did it differ from the ordinary female. They breed twice, and, I believe, in some cases thrice: I have seen fresh eggs on April 4th, and as late as June 19th. Eggs four or five, delicate pale blue, unspotted, .85 in. by .68 in. Nest of grasses and bents, in all manner of places. I have found them commonly in holes in old quarries or roadside cuttings; also in crevices of walls; in rocks, even when some little distance from the shore; in holes in trees; on the branches of trees; in stove- and water-pipes; in calabashes, boxes, &c., hung up for them in the verandahs of houses; in the folds of a canvas awning outside the door of one of the officers' quarters at Prospect Camp; and in several other curious situations. The female sits close, and I have caught her on the nest. The young are strikingly spotted till their first moult. The males sing much in the early morning in spring, both stationary and on the wing, and continue their song, though with diminished ardour, till an hour or so before sunset. A warm sunny day in winter, however, is the time to hear them in perfection, when a favourite cedar grove will resound with their combined melody, each songster perched on the very topmost twig of a tall cedar. The song is merely a short, but sweet, wild little stave, sounding to me not unlike that of the Blue Thrush, *Monticola cyaneus*, as I used to hear it from the heights, far away above my head, on the rock of Gibraltar. The call-note is a soft twitter;

but they have also a loud double note, "cher-wee," reminding one forcibly of that of an *Aegialitis*. Attempts are made frequently to bring up young birds from the nest, but they rarely succeed. A few live ones are to be seen in captivity, presumably adults captured by birdlime or in traps; but as a cage bird it is a failure. It occasionally drives the Red Bird, *Pitylus cardinalis*, from its nest, even after eggs have been laid, and uses it as a foundation for its own. This is somewhat extraordinary, when one considers the formidable bill of the victim; but the Blue Bird is a determined little fellow, and fortune favours the bold. A great number of "crawlers"—long scaly grubs, with no end of legs—are destroyed by these useful birds, who will sit patiently watching for them on a convenient twig, swooping down on the first comer, and bearing him off in triumph. They will also dart into the air after passing insects much like a Flycatcher, returning each time to their starting-point. They are very bold in pursuit of prey when they have young to feed, but always visit their nest with extreme caution should an observer be near. [Mr. Bartram believes that they do not migrate, but merely collect into flocks for the winter.]

—H. D.]

Sitta canadensis, Red-bellied Nuthatch.—One specimen only, in Mr. Bartram's collection, shot by himself near his house at Stocks Point.

[*Certhia familiaris*, Brown Creeper.—A male bird of this species was shot by Bendall, an old soldier of the 53rd regiment, out of three or four seen in Devonshire Swamp, on November 24th, 1876.—H. D.]

Alauda arvensis, European Sky Lark.—Mr. Hurdis shot the only example of this well-known bird on June 12th, 1850. It had no appearance of being an escaped cage bird; and I do not see why a strong gale should not have driven it even to such a distance from its ordinary line of flight. Prof. Newton, in his fourth edition of Yarrell's 'British Birds,' alludes to this specimen in describing the geographical distribution of the species, but seems inclined to doubt its being a genuine wild bird. It is possible that it may have been the Missouri Sky Lark, *Neocorys Spraguei*, recently ascertained to be by no means uncommon in the "Far West." The bird, I believe, was presented to Major Wedderburn. A further examination might lead to interesting results. It is worthy of remark that this unfortunate bird was described to Mr. Hurdis

by a "coloured" lad as being "less than a pigeon, and of a light-green colour about the neck;" also as making a "curious noise" in the air, and, as not knowing apparently "how to get down again," finally "tumbling down like a stone." This is a fair sample of the information one may expect in Bermuda.

Eremophila alpestris, Shore Lark.—Three examples are recorded by Major Wedderburn: two at St. George's, October 25th, 1849; and one at Spanish Point, February 27th, 1850. In Mr. Bartram's collection are three specimens. I shot a fine male on the north shore, close to the old lunatic asylum, on January 29th, 1875. It fell into the sea, in the middle of a huge mass of "gulf" weed, through which I had to swim some distance for it. Fortunately I was not observed, or I might have found myself an inmate of the adjacent building. [Two others were obtained, and brought to me in January, 1876.—H. D.]

Anthus ludoricianus, Brown Lark; Pipit.—Major Wedderburn has a specimen in his possession, shot by Mr. Fozard on November 26th, 1848. There are two others in Mr. Bartram's collection, shot by himself near St. George's.

Mniotilla varia, Black-and-White Creeper.—In October, 1849, one example of this neat little warbler (it belongs to the *Sylvicolidæ*, though the English name points to the *Certhidæ*) was shot at St. George's; and two or three more seen between that town and Hamilton. One was obtained at Ireland Island on October 27th, 1852. Mr. J. M. Jones shot one in Devonshire Marsh, in January, 1871. I found them quite common in the autumn of 1874, and winter succeeding it, and obtained several specimens, chiefly in the tall cedars of Devonshire Swamp and around Hungry Bay. This bird was one of my especial favourites; and I used to sit for hours watching its quick and graceful motions, and its dexterity in capturing insects. Its mode of "registering" branch after branch, commencing at the bottom and ending at the outermost twigs, is very like that of our familiar European Creeper.

Parula americana, Blue Yellow-backed Warbler.—This diminutive bird seems hardly fitted for a journey of six hundred miles across the ocean. Nevertheless, four examples are on record, viz.—one shot by Canon Tristram at Ireland Island, on April 21st, 1849; one found by Mr. Hurdis in 1853, in a collection of Bermuda skins sent to him for examination; and two others seen by myself, one being shot near Devonshire Swamp on October 19th, 1874.

My bird proved to be a male in brilliant plumage; the other, probably a female, escaped. The two were fluttering and creeping about at the extreme end of a large cedar branch, like a veritable *Parus*.

Protonotaria citræa, Prothonotary Warbler.—I had the pleasure of examining and identifying a specimen of this handsome warbler, the only one yet obtained, in Mr. Bartram's collection. It was presented to him by Mr. Hyland, jun., of St. George's, who shot it, near that town, out of a small flock of the species, in the autumn of 1874.

Dendroëca æstiva, Blue-eyed Yellow Warbler.—Mr. Bartram has two specimens, obtained at different dates, the only ones on record. It is somewhat strange that this abundant and prettily-coloured North American species should not have been a more frequent visitor, or rather more frequently observed. Doubtless it *has* found its way to Bermuda, like others of the genus, to a much greater extent; but the cedar groves of the islands afford an almost impenetrable shelter to such birds, and, besides, no one but the most ardent collector thinks it worth while looking after them. [Two birds of this species, both males, shot in Devonshire Swamp on November 23rd, 1875, are now in my collection.—H. D.]

Dendroëca virens, Black-throated Green Warbler).—Another novelty brought to light in examining Mr. Bartram's birds. He has three examples, one in the obscure plumage of youth, the others in the "fall" or female plumage of the adult. Unfortunately, Mr. Bartram has sexed none of his birds; the bodies, in fact, of all specimens under six inches in length are left within the skin (the "trail" only being removed), and preserved by being thoroughly saturated with a wonderful mixture of the old gentleman's own composition. This certainly keeps the birds from decay and insect ravages most effectually, but I cannot say it conduces to their appearance; the bodies dry slowly and surely, and thus contract the plumage of the breast and abdominal region to a deplorable extent.

Dendroëca cærulescens, Black-throated Blue Warbler.—Two specimens of this striking-looking Warbler are in the Bartram collection, shot by Mr. Bartram in a field of arrow-root on his farm not many years since. No others are recorded.

Dendroëca coronata, Yellow-crowned Warbler.—Several examples are recorded in 'The Naturalist in Bermuda.' Three of

of these were shot on Somerset Island by Captain Tolcher, 56th Regiment, out of a flock of more than a hundred birds. In the Bartram collection are four specimens. It was the commonest species I met with in November and December, 1874, in the course of my evening rambles among the cedar groves of Devonshire parish. Here I obtained a few specimens, and could have shot many more had I wished. They were rather shy, and flew rapidly from tree to tree, with a loud "chip" of alarm, showing the brilliant yellow of the rump plainly. Those I shot were all in winter plumage, the yellow crown concealed by brown feathers.

Dendroëca castanea, Bay-breasted Warbler.—A young bird in the Bartram collection is the sole representative of the species. It is in obscure plumage, but shows the buffy tint on the sides of the body so characteristic of the species.

Dendroëca discolor, Prairie Warbler.—Only one, obtained by Major Wedderburn at the dockyard, Ireland Island, on the 3rd October, 1848.

Dendroëca palmarum, Yellow Redpoll Warbler.—Two shot by Major Wedderburn in Pembroke Marsh, on December 17th, 1847, and December 3rd, 1848, respectively. Mr. Bartram has two other specimens.

Dendroëca pinus, Pine-creeping Warbler.—Has occurred in considerable numbers. A good many occurred on September 27th, 1849, departing again in a few days. Several were captured outside the lantern of the lighthouse in the dark and rainy night of the 5th September, 1850. On October 15th, 1850, Colonel Drummond obtained specimens from a large flock, which he observed coming in from the sea and settling on some trees within the keep at Ireland Island. Mr. Bartram has two specimens, one of which (a male in spring plumage) was shot near his house and brought to him while I was paying him a visit on March 16th, 1875. The species would seem, therefore, to visit the islands on both migrations.

Seiurus aurocapillus, Golden-crowned Thrush.—I shot the first recorded specimen on the edge of Devonshire Swamp, on the 19th October, 1874. This brought to light another, shot in the autumn of 1873, and set up in a case with Blue and Red Birds by Gibbs, an old soldier of the 53rd Regiment, and an excellent taxidermist, in the service of Lieut. Johnston, R.E. I afterwards identified two others, killed a few years ago, in Mr. Bartram's possession. The

species was numerous in the autumn of 1874, in and near Devonshire Swamp, and I procured specimens on the 24th October and on the 12th and 16th December, thus establishing it as a real 'Mudian.' I wonder it had hitherto escaped notice; its loud "peche, peche," is very striking, and drew my attention at once to the presence of something new. It was very shy.

Seiurus noveboracensis, Water Thrush.—One of the commonest but most interesting of autumnal visitors. It appears regularly early in October, and a few remain all the winter. Throughout October and November there is hardly a mangrove swamp, great or small, whence its sharp but musical "chip" may not be heard at any time during the day. Early in the morning, especially when an ebbing tide has left bare the quaint tangled roots of the mangroves and their muddy surroundings, it is comparatively easy to approach this wary little bird, but later in the day it requires great caution, and a certain amount of activity, to procure a specimen. To persons out of training, requiring strong exercise, I can confidently recommend a protracted "stalk" after *Seiurus* among the mangrove roots, such as I undertook myself before becoming better acquainted with the habits of the species. These birds wag the tail like a *Motacilla*, as they feed on the edges of the tidal pools, and flit from root to root, uttering at times their loud monotonous cry. While waiting for ducks at daylight in the larger swamps, I have seen them within a few yards of me, in happy ignorance of my presence. Major Wedderburn says (Nat. in B., p. 27), "Several times, at Riddle's Bay, I have noticed seemingly a larger species of this bird, but never succeeded in killing any of them." This was perhaps the larger variety (or species), *S. ludovicianus*. I did not meet with any specimens myself.

Geothlypis trichas, Maryland Yellow-throat.—By no means a frequent visitor, only two specimens being known. The first was shot by Mr. Hurdis in a bushy swamp near the sluice-gates on the 18th October, 1853; the second is in Mr. Bartram's museum, obtained near Stocks Point.

Myiodioctes mitratus, Hooded Flycatcher.—A male shot at Ireland Island, by Mr. Abbott, 20th Regiment, on March 30th, 1847. The female was seen, but not obtained.

Setophaga ruticilla, American Redstart.—Two in Mr. Bartram's possession, shot by him near his house some few years since. No others are on record.

Pyranga rubra, Scarlet Tanager.—This handsome bird has visited the Bermudas on its vernal migration on several occasions. Two or three examples were obtained in April, 1850; four were seen, and one shot, in May, 1851. Mr. Bartram has several specimens, male and female, and obtained a splendid male near his house early in May, 1875. One was seen and nearly captured after an exciting hunt by Lieut. Denison, R.E., at Somerset, on April 25th, 1875. Mr. J. M. Jones informs me that a male was shot on the edge of the lagoon at Ireland Island on May 6th, 1869; also that another frequented a garden in Smith's Parish for several days at the beginning of May, 1875. The female is such an obscure-looking bird that she doubtless often escapes the notice invariably accorded to her brilliant partner. There is no recorded instance of the occurrence of this species on its southward journey. Capt. Rooke, 53rd Regiment, and I saw what we took to be a female Scarlet Tanager on October 17th, 1874, near Basden's Pond; but we could not get a shot to confirm our suspicions.

Pyranga aestiva, Summer Red Bird.—The same remarks apply to this species, with reference to its visits to the islands, as to the preceding. It appears to have been especially numerous in April, 1850, when a female was shot on the 9th; a beautiful male, by Major Wedderburn, at Peniston's Pond, on the 19th; two by the same gentleman, at Harris's Bay, on the 20th; and several others. Mr. Bartram has a male and two females, one of the latter killed a year or two since. On the 29th April, 1875, I shot a fine female in Smith's Marsh; it was in wonderful condition, the body being literally coated with layers of orange-coloured fat. The stomach was full of the remains of the Bermuda wasp—a most unpalatable-looking morsel, I should have thought. Wilson alludes to the insectivorous habits of this species.

Hirundo horreorum, Barn Swallow.—I shall take the liberty of quoting from the 'Naturalist in Bermuda,' to illustrate the uncertain appearance of the Swallow tribe in the islands. Mr. Hurdis says (p. 68):—"I can with safety affirm that from October, 1840, to September 12th, 1846, not a Swallow of any description came under my observation, though I believe they were sufficiently common in the September of the former year." Major Wedderburn says of this species (p. 34):—"Rarely seen in April and May, but sometimes numerous in August and September. I have seen it as early as August 1st in the year 1848, at Hamilton, and they were

numerous on that day at Hungry Bay and Riddle's Bay. This species was very numerous in the great flight of Swallows in September, 1849." A few Swallows, probably of this species, appeared in August, 1874, but I was away at the time. From April 30th to May 11th, 1875, there were not a few visitors, and several specimens were obtained. Five of these birds frequented the grassy slopes in the vicinity of Warwick Camp, while I was going through the annual course of musketry there with my company. They disappeared on May 11th, without my having been able to procure a specimen.

Tachycineta bicolor, White-bellied Swallow.—Has only visited the islands once, in the great flight of September, 1846, when it appeared in considerable numbers. [One in my collection was shot at St. George's, in September, 1875.—H. D.]

Cotyle riparia, Bank Swallow; Sand Martin.—Identical with the European bird. Two specimens were shot by Capt. Lye, in September, 1846; and a few seen near Hamilton on August 8th, 1847.

Progne purpurea, Purple Martin.—This fine bird, a straggler to the British lists, has only, like *T. bicolor*, appeared on one occasion, during the "entrada" of September, 1849, when it was numerous.

Ampelis cedrorum, Cedar Bird.—Occurs rarely, both on its autumnal and vernal flights. Three were shot out of a flock of about thirty, near Hungry Bay, on October 10th, 1847; four on December 17th following, one of which had a few of the brilliant wax-like tips to the secondaries; two out of a flock of twelve in December, 1849; one seen on January 5th, 1850; one shot on the 6th and another on the 10th April, 1850; one on December 2nd, 1851. In addition to these Mr. Bartram has three specimens, obtained at different dates. I did not myself meet with the species, or hear of its occurrence, during my stay. [Two were shot out of a flock of five on the 11th, and a third on the 22nd September, 1875, in Devonshire Swamp, by Lieut. Festing, 20th Regiment. A male bird of this species was obtained near Prospect, on November 24th, 1875.]

Vireo noveboracensis, White-eyed Vireo.—The smallest and one of the commonest resident Bermuda birds, familiar to all through its sprightly ways, loud song, and astounding impudence. It is termed locally, "chick-of-the-village," or, "chick-choo-willio,"

from its note. This is, however, very variable, and hardly any two birds give it the same rendering. One has a prefatory "chick," in addition; another tacks the extra "chick" on at the end of his version; while others cut it short, or jumble it all up together at random. One particular variety is "ginger-beer-quick," a call very much adapted to the climate of Bermuda. In short, there is no end to the variations; and a stranger might well imagine, as I did myself at first, that there was more than one species present. It was some little time before I settled the matter to my own satisfaction by careful observation of every "chick" I heard singing, as I expected to meet with *V. gilvus* or *V. Belli* among the numerous musicians. The colour of the iris increased my difficulty, as I found it to be brownish, brownish gray, or gray—rarely white, as stated by authors. I presume it is only fully adult birds that show the real white iris; young birds have it decidedly brownish, and I have seen a female sitting on eggs with an undeniable brownish gray "cast" in her bright little eye. It would be a waste of time and valuable space to describe the pretty pensile nest of this species, so familiar to all ornithologists. I have found it usually from three feet to twelve feet above the ground, in cedars, mangroves, Bermuda "holly," pomegranate, and lemon trees, but most commonly in cedars. I never met with more than *three* eggs or young in one nest; authors assign four or five to the genus. The eggs average .71 in. by .52 in., white, with a few dark brown or black dots; some are entirely white. The young at first have the yellow of the wing bars and forehead very pale and dingy. This is a sad little torment to the collector. It comes hissing and scolding within a foot of one's head, puffing itself out with malignant fury. I have touched one with my gun in the thick bushes before it would budge an inch. And when one is on the *qui vive* for rarities among the big cedars, the little wretches will come from all parts to irritate and deceive one, playing all sorts of antics on the topmost branches, apparently imitating the movements of a *Dendroëca* or other *Sylvicola*, in order to induce one to waste a charge on them. Several times they succeeded with me; and on one occasion, the bird having lodged at the top of a very ugly-looking tree, I tore my hands and clothes to pieces in my anxiety to secure the supposed prize. But in spite of this I have a great regard for the cheerful, restless little fellows, whose presence does so much to relieve the monotony

of the everlasting cedars. They are very dexterous in catching insects among the foliage, their manner of feeding seeming to be intermediate between that of a Flycatcher and a Warbler. You can hear the "snip" of their mandibles as they secure their prey for a considerable distance. I have seen one catching flies off the back of a cow, jumping vigorously at them from the ground, and "snipping" them off neatly as they buzzed round the recumbent animal. Mr. Hurdis says (Nat. in B., p. 71) :—"In September it delights to feed on the small white berries of the sweet-scented *Tournefortia*, and it is also fond of the small fiery capsicum, known by the name of 'bird-pepper,' the pods of which it plucks and swallows entire." It is on record that the newly-fledged young of this species have been found entangled in the meshes of the web of the "silk" spider, *Epëira clavipes*. These webs are of great size and strength, extending for many feet between adjoining cedars, and the number of them among the woods in summer and autumn is almost incredible. In all my rambles, however, I never met with an instance of poor little *Vireo* having walked into *Epëira's* parlour.

Vireo olivaceus, Red-eyed Vireo.—The first I met with was captured in the officers' quarters at Prospect Camp, on October 14th, 1874. In March, 1875, I identified three specimens belonging to Mr. Bartram, all shot by himself near Stocks Point. This bird, though somewhat larger, is sufficiently like its brother, *V. noveboracensis*, to have escaped detection in previous years.

Collurio borealis, Great Northern Shrike.—Not a great many have occurred, though it would appear to visit the islands on both migrations. One was shot by Dr. Cole, 20th Regiment, on October 31st, 1846; one by Mr. Hurdis, January 23rd, 1847; another by Major Wedderburn, near Harris Bay, March 12th, 1850; and a fourth by Mr. J. M. Jones, on the "Model" Farm, Smith's parish, in January, 1872. Besides these there are three specimens in Mr. Bartram's collection. Most of these above-mentioned examples were in immature plumage. [One shot near the garrison instructor's house, at Prospect, on January 1st, 1876, is in my collection.—H. D.] It is strange that the other North American species, *C. ludovicianus*, of more southerly distribution on the continent than *C. borealis*, should not have been observed in Bermuda.

Curvirostra americana, American Crossbill.—Of this species Major Wedderburn says:—"A specimen of this bird was captured

in the dockyard at Ireland Island, January 20th, 1850, and got quite tame, and lived for several days in my room; but poisoned itself by eating part of a composite candle, which it had cut nearly in half with its strong bill during the night. I shot three specimens near Mr. Ewing's house, April 5th, 1850, and saw a small flock on several occasions near Pitt's Bay, but they were so shy I could not get near them. They disappeared early in May." Mr. Bartram has several specimens. On November 17th, 1874, three were observed on some cedar trees at Prospect Camp. Two males were shot among some sage bushes, near the shore at Warwick, by Gibbs, on the 25th of that month; and another male was obtained at Prospect about the same time. These may have been the trio originally seen. The stomachs of the two Warwick birds were crammed with small green caterpillars, and contained no trace of seeds. The insectivorous nature of the Crossbill is not mentioned by Wilson; it is alluded to by Dr. Saxby in the 'Birds of Shetland.' This species must visit Bermuda both going and returning.

Curvirostra leucoptera, White-winged Crossbill.—A less frequent visitor than the preceding, on its northward journey only. A fine male was killed on May 11th, 1852, by a boy who had another in his possession; date unknown. An officer of the 56th Regiment shot one, a female, at Somerset, in March, 1852. Mr. Bartram has obtained a pair, male and female. This bird has occurred several times in Great Britain, and it is somewhat remarkable that the preceding species, *C. americana*, has not yet paid us a visit. I expect it will find its way across the Atlantic some day, and share the fate of every unfortunate straggler to our inhospitable shores.

Aegithus linarius, Redpoll Linnet.—Only recorded previously in 1847 and 1850. Two were obtained, February 8th and October 11th, in the former year. In March, 1850, flocks of this bird appeared in the neighbourhood of St. George's, and several specimens were obtained there and elsewhere throughout the islands. A goodly number visited the islands in small flocks in January, 1875: these were very tame at first, but soon became shy. Specimens were obtained during the month at all parts of the islands.

Chrysomitrис pinus, Pine Linnet.—Two specimens in Mr. Bartram's collection are the only ones on record. They were obtained near Stocks Point.

Plectrophanes nivalis, Snow Bunting.—This is a pretty constant

visitor, seldom failing to make its appearance, in large or small numbers, in December or January. They were particularly numerous in 1850. I am credibly informed that of late years they have been seen in considerable numbers feeding on the parade ground and round about the stables, like sparrows, at Prospect Camp. One was seen there in December, 1874. Three, of which I procured one, frequented the Walsingham end of the Causeway in January, 1875. Others were seen at St. George's and elsewhere about the same time. This bird has not appeared in spring.

Passerculus savanna, Savannah Sparrow.—Only two on record. Major Wedderburn killed one in Pembroke Marsh, April 11th, 1850; I shot one at Shelly Bay Marsh on January 29th, 1875.

Pooecetes gramineus, Bay-winged Bunting.—One shot by Capt. M'Leod at St. George's, October 25th, 1849. [I saw several and shot one of them at Whale Bay, September 9th, 1876.—H. D.]

Coturniculus Henslowii, Henslow's Sparrow.—"Mr. Hurdis shot one specimen out of a small flock of these birds in Pembroke Marsh, on December 2nd, 1850. They had frequented the dense reeds and rushes for a fortnight previously." (Nat. in B., p. 30.)

Melospiza palustris, Swamp Sparrow.—A solitary example was obtained in Pembroke Marsh on December 3rd, 1849. I saw a bird in the Shelley Bay Marshes in January, 1875, which I am almost certain belonged to this species, but I could not get a shot.

Junco hyemalis, Snow Bird.—Two in the collection of Mr. Bartram, were shot by him at Stocks Point.

Passer domesticus, European Sparrow.—Some few years ago a number of these birds were imported from New York (where they are now numerous), and turned out at St. George's; but many of them subsequently disappeared, probably victims to the cats, which swarm in all parts of the islands. The remainder, however, appear to be flourishing, and in the spring of 1875 there were several nests in the new barracks above the town. A second importation, from New York also, took place in September, 1874, about fifty birds being liberated in the vicinity of Hamilton. These soon scattered in all directions, but about a dozen took up their quarters in the garden of the Court House at Hamilton, and could be seen there daily during the winter following. I have no doubt they will increase and multiply after their manner, and in time become as much a nuisance as they are now a curiosity. I certainly question

the propriety of introducing these quarrelsome birds (for the sake of the war they wage on the insect tribes during the breeding season *only*) into the aristocratic society of the Blue and Red Birds, which they will infallibly drive in course of time out of the town gardens and enclosures altogether. I observed a single specimen of the European Goldfinch, *Carduelis elegans*, near Harrington Sound, in April, 1875; it was very wild, and I could not get near it, but I imagine it must have been an escaped prisoner. This species is reported to have occurred in Massachusetts (Allen, Am. Nat. iii. p. 635), but the same explanation doubtless applies.

Passerella iliaca, Fox Sparrow.—Only one yet obtained; shot by Mr. Bartram in a bush near his house a few years since.

Goniaphea ludoviciana, Rose-beaked Grosbeak.—A female bird of this species was shot by Colonel Drummond on the 9th October, 1849, near St. George's, and a fine male by Mr. Hurdis on the 15th April, 1850. Mr. Bartram has four specimens, one of which is a male in immature plumage. A female was caught by a cat in the town of Hamilton on the 16th October, 1874. The species appears to visit Bermuda twice.

Cyanospiza cyanea, Indigo Bird.—I had the pleasure of introducing this species into the Bermuda lists, the first specimen being a female shot near Devonshire Church, on January 14th, 1875. In March following I examined an immature male, shot by Mr. Bartram on the 1st of that month, and also unearthed two dingy female specimens in his collection, killed some years previously. I obtained a female in Devonshire Marsh on the 8th, a young male on the 11th, and another on the 22nd of March, and one or two others were subsequently procured in the same locality. There appeared to have been a regular "entrada" of them, and it was remarkable how pertinaciously they stuck to certain cedar groves round about Devonshire Church. I saw many others, and watched the changes of plumage of the male birds with great interest. By the end of April they had acquired the rich blue livery of the adult, and rivalled the Blue Bird in brilliancy of colouring. Lieut. Tallents, of the 20th Regiment, shot a splendid specimen on April 29th. This was the last we saw, and I imagine they all departed shortly afterwards, though we fondly hoped they might stay to breed. I found them easily approached at first, but when once disturbed they flew very rapidly away into the thick cedars. Their call-note was a loud, harsh "chee" or "tzee."

Cardinalis virginianus, Cardinal Red Bird; Virginia Nightingale.—The well-known Red Bird of Bermuda is an abundant resident throughout the islands, everywhere conspicuous by its brilliant plumage and loud but not unmusical song. This bird is a general favourite with all classes, and in great esteem as a cage-bird. Formerly considerable numbers were caught by the "coloured" boys in the neat trap depicted in 'The Naturalist in Bermuda'—an introduction, as I am informed, by Mr. J. M. Jones, from Somersetshire, and not a 'Mudian invention. Fortunately, however, there are now stringent local laws for the protection of the resident birds, and these traps are seldom seen. I have tried in vain to bring up the young from the nest. The Red Bird breeds twice a year in Bermuda. Fresh eggs have been found as early as the 1st April, and I find in my notes that I saw young birds just able to fly on the 19th; but these are exceptional cases. As a rule, the two clutches of eggs are deposited about April 10th and May 30th respectively. The eggs are three to five in number, averaging 1·00 in. \times .73 in. They vary much in size and markings, but are usually greenish white, irregularly marked with few purplish and many amber blotches. The nest is bulky, built of twigs and roots, lined with dry grasses. This lining alone serves to distinguish some of the nests from those of the Cat Bird, which they much resemble; they are usually at a greater elevation, however, and are never ornamented with rags or paper. The parent birds are extremely solicitous in bringing up their offspring, and attend them assiduously long after they are able to fly, betraying their anxiety by much "tick-tick-ing," flirting of tails, and raising of crests. To see a fine old paterfamilias in all the glory of his rich vermillion garments, tail and crest in air, now on a post, now on an oleander or cedar bough, all the while uttering his sharp "tick" of alarm, while the more sober-coloured mother is ministering to the appetites of the children, is a great treat, and will ever be associated in my memory with the hot sun, the white houses, dark cedars and fragrant sage-bushes of Bermuda. The young resemble the female, being ashy-brown, paler below, with evident traces of the red on the crest, wings, tail, and under parts. I have mentioned the "tick," or call-note of this species. The song is exceedingly variable, consisting of a series of musical whistles. There is also a strange "whir-r-r-r," like a large bird suddenly rising on the wing, which is very peculiar. A most remarkable fact is that the

notes are changed according to season. Mr. J. M. Jones called my attention to this, too late, unfortunately, for me to make any lengthened study of the changes; but I heard sufficient to satisfy myself of their occurrence. Thus, in December and January, nearly every songster I listened to was "way-too-ing" at the top of his voice, and I occasionally heard the peculiar "whir-r-r-r." Later on "way-too" became less frequent, being replaced by the monotonous "tew, tew," and other notes. A more careful and lengthened series of observations would be of considerable interest. In spring the Red Bird commences to sing at daybreak, considerably before the Blue Bird. A wounded Red Bird can give the unwary collector a most painful nip with his strong beak. In spite, however, of his strength, he allows himself to be driven ignominiously from his nest by the smaller Blue Bird, as already mentioned. The skin of this species is remarkably delicate, almost resembling tissue-paper. The rich vermillion plumage soon fades when exposed to light.

Dolichonyx oryzivorus, Bob-o-link; Rice Bird.—Mr. Hurdis says of this bird:—"The Rice Bird is not known to visit the Bermudas on its vernal flight, although in September and October it seldom fails of being found there, generally in small flocks, and on one occasion in considerable numbers. They frequent the marshes, where the ripe panicles of seed from the reeds and sedge offer an ample abundance of their favourite food." And Major Wedderburn remarks:—"During some years this bird is not uncommon, but always found in winter plumage. They are so extremely fat that it is almost impossible to preserve them." I have little to add to the above notes, except that one of Mr. Bartram's specimens is a male in imperfect summer plumage. I never met with the species myself, but they were familiar to many of my friends. They did not visit the Bermudas in the autumn of 1874. [In September, 1875, they were numerous.—H. D.]

Molothrus pecoris, Cow Bird.—In Mr. Bartram's collection there is one example of this singular bird, which takes the place of our European Cuckoo in North America, building no nest, but depositing its eggs by stealth in the nests of Warblers, *Vireos*, Sparrows, &c. This solitary specimen is a male. It was shot at Stocks Point by Mr. Bartram.

Icterus Baltimore, Baltimore Oriole; Golden Robin.—"Captain Tolcher, 56th Regiment, shot one of these birds early in October,

1854, at Somerset. Mr. Hurdis found it amongst his collection of skins on the 20th of the same month, when Capt. Tolcher assured him that Mr. Harford, of his regiment, had killed another specimen about the same time, which, from being very much mutilated, he had unfortunately thrown away" (Nat. in B., p. 27). A third example, a male in splendid plumage, is in my own collection. I shot it near Hungry Bay, on April 28th, 1875. The bill and feet of this bird were bright livid blue.

Corvus americanus, American Crow.—The early history of this bird, so far as the Bermudas are concerned, is somewhat obscure. In Smith's 'History of Virginia' (to which colony Bermuda at one time belonged), date 1623, Crows are mentioned as being numerous in the islands. Major Wedderburn says, however (Nat. in B., p. 33):—"A few of these birds are generally to be seen between the lighthouse and Hamilton. I have never found their nests, but they are known to have bred, as a few young Crows were observed near Warwick Church during the first week of April, 1849. It is supposed that they were introduced from Nova Scotia some few years ago." Mr. Hurdis did not, apparently, find the species numerous, for he says (Nat. in B., p. 66):—"In August, 1854, eleven of these Crows were observed associating together at Gibbs Hill, by the late Colonel Oakley, 56th Regiment. This was double the number which had hitherto frequented those parts, and arose, doubtless, from the young of that season." It is somewhat difficult to reconcile the above evidence. Can the species, once numerous, have become extinct, and have then been introduced again? This is possible, but I am inclined to the belief that there have been Crows, more or less, in Bermuda since 1623, their wary nature and their partiality for the dense cedar groves causing them to have been but little noticed. However it may be, they are numerous now; so much so, that a price has been set on their devoted heads by a recent enactment—half-a-crown a bird, and sixpence an egg. That this is a wise and necessary measure is universally conceded, as they do much damage in the breeding season, by destroying young poultry, and the eggs and young of the other resident birds. As is well known, this species is gregarious, except during the actual time of breeding. As soon as the young are well able to fly, the scattered families consort together. I have seen as many as sixteen in one flock in June. Three or four are commonly seen together in winter, when they frequent the rocky shores in search

of shell-fish, &c. At the approach of the breeding season they separate into pairs, and select the most retired cedar groves for their nesting places, the same couple resorting to a particular spot for many years, if undisturbed. The nest is a bulky structure of sticks and cedar-bark, warmly lined with the latter material and with goats' hair; it is usually in a wide fork, against the trunk, and never very high up. Eggs, usually four, exactly like those of our European Crows. I have found as many as half-a-dozen nests, in various stages of dilapidation, in the same clump of trees—the work, doubtless, of the same pair. They seem invariably to build a fresh one every year. Only one brood appears to be raised, leaving the nest about the end of May. The earliest nest I heard of was one containing four fresh eggs, on April 3rd, 1875. Lieut. Denison and I found five young birds in one nest, two of which were somewhat less advanced in feathering than the remainder; and, as we were mobbed all the time we were at the nest by *four* old Crows, we came to the conclusion that the nest must be common to both pairs—rather an odd thing, when one considers the solitary breeding habits of the species. Mr. Bartram has a specimen measuring $21\frac{1}{2}$ inches in length, which we at first thought must be a Raven, *C. corax*, particularly as it did not mix with the other Crows, and was shot on a small island it frequented; but subsequent examination inclined me to believe it was only an unusually large bird, perhaps a little stretched in stuffing—probably the variety *C. floridanus* of Baird. Ordinary specimens measure 18 to 20 inches.

Tyrannus carolinensis, King Bird; Bee Martin.—Recorded as very numerous in all the swamps in 1850, but not mentioned as occurring at other times, though Mr. Bartram has one or two specimens of a later date. It would appear to be only a spring visitant. A considerable number appeared in April, 1875, a small band of these attaching themselves to the Devonshire and Hungry Bay district, where several specimens, male and female, were obtained. These were all immature, or rather in winter plumage, with the flame-coloured head-patch concealed by black tips to the feathers. [Several were seen by me at Hungry Bay on the 22nd September, 1875. Unfortunately I did not procure a specimen, and so establish the fact of this species visiting Bermuda on its southern journey.—H. D.]

Tyrannus dominicensis, Gray King Bird; Pipiry Flycatcher.—

Only three specimens are on record, *viz.*, one obtained by Major Wedderburn in Mr. Hurd's garden on March 30th, 1850, and two others on St. David's Island on April 15th, 1850.

Contopus borealis, Olive-sided Flycatcher.—Mr. Bartram has one, shot by himself on his farm not many years since.

Contopus virens, Wood Pewee Flycatcher.—A single example was obtained by Mr. Hurd on April 30th, 1852.

Empidonax Traillii, Traill's Flycatcher.—One specimen is in Mr. Bartram's collection, shot at Stocks Point.

Chordeiles virginianus, Night Hawk.—I cannot do better than quote from 'The Naturalist in Bermuda' the following:—"These curious birds are sometimes very common in April, and also in September and October on their migration north and south. The marsh below Government House was their great resort, when, just as it was getting dusk, they would appear one by one, and soon be skimming about in all directions, uttering every now and then a sharp whirring sort of cry. They double and rush about in a most wonderful manner, frequently depressing first one side, then the other. Although flying close together, they seem to try and keep apart, each having seemingly its own hunting ground" (Wedderburn). "When this bird visits the islands of Bermuda from the north, it invariably appears between the 20th of September and the 11th of October, and, on its vernal flight from the south, arrives with wonderful precision between the 23rd and 30th of April" (Hurd). Individuals of this species were observed by officers of Prospect Garrison on February 20th and 28th, 1875. It would almost seem probable that these wintered in Bermuda; but the question requires further investigation. They are occasionally picked up dead or in a dying condition. One was found dead in the streets of St. George's on the 26th April, 1875, and a live one was brought to me the same day. The stomachs of several examined in October, 1874, contained numbers of the highly-perfumed "green bug," *Rhaphigaster prasinus*, so obnoxious to delicate olfactory nerves. For this good service alone the poor birds should be religiously protected during their short visits.

Chætura pelasgia, Chimney Swift.—One was shot on the 13th September, 1849. On the 24th of that month Mr. Hurd noticed several, left behind after the great flight of the Swallow tribe, already alluded to, had taken its departure. Mr. Bartram obtained one in September, 1874; but I did not meet with the species myself.

Trochilus columbris, Ruby-throated Humming Bird.—I found the history of this bird's occurrence in Bermuda in a very unsatisfactory state. Major Wedderburn writes:—"There is a tradition that the Humming Bird visited the islands of Bermuda in considerable numbers about thirty years ago; but of late years they have not been noticed till the 26th April, 1852, when Mr. Hurdis wrote to me, saying that Mr. John Darrell (son of the Attorney-General, now Chief Justice, of those islands) had seen a Humming Bird under the windows of his father's house, where it was busily employed entering the large white bell-shaped flowers of the giant *Stramonium*, its tail only at times being visible. Another was seen about the same time, and within about two miles of the same place, by a Miss Watson, in her brother's garden." Referring to the above, Mr. Hurdis says:—"My endeavours to ascertain the truth of the tradition alluded to by Major Wedderburn ended in disappointment. The bird seen by Mr. Darrell was described to me as greenish in colour, with the tail—the only part visible at times—tipped with white. I need not observe that this characteristic appertains to the female." I was, therefore, much pleased to establish its occurrence beyond a doubt, when going through Mr. Bartram's collection with him. He has a genuine female specimen, shot with powdered rice by himself close to his house, his attention having been called to the diminutive stranger by one of his labourers, who thought it was a large moth. Two others were seen at the same time, but not obtained. How these little birds got to Bermuda is a marvel. They have powerful wings for their size, calculated to keep up that humming vibratory motion necessary for their mode of feeding; but one would think that such a long flight across the sea would induce weariness in so small a frame, and leave them at the mercy of the winds and waves.

Ceryle alcyon, Belted Kingfisher.—"These birds arrive regularly about the middle of September, and are to be found in all the mangrove swamps, creeks, and ponds in the islands. Many remain during the winter, but they all disappear about the middle of April" (Nat. in B., p. 33). I have seen these birds as late as the 26th April, and at one time thought they must occasionally remain to breed; but after much careful watching, in which I was assisted by my friends, I came to the conclusion that they all depart, sooner or later, to breed on the North American continent. Hungry Bay is a favourite resort of these fine birds. I have seen six or seven

there together, chasing one another, darting at the little fish in the pools, and uttering their harsh, rattling cry. They affect the same hunting grounds, especially those birds that remain for the winter, and day after day, as one drives past the creeks and sheltered bays, one sees the same solemn-looking individual on the accustomed rock or cedar-bough, one eye on the fish in the water below, the other on the passers by.

Coccyzus erythrophthalmus, Black-billed Cuckoo.—The first example recorded was shot by Gibbs early in October, 1874, at the same time as a number of the succeeding species, *C. americanus*, from which its smaller bill, less white on the tips of the tail-feathers, and red ring round the eye, at once distinguish it. Mr. Bartram also obtained a specimen that autumn, and I found two others in his collection, labelled *C. americanus*. I saw one near Devonshire Bay on the 19th April, 1875, and one (probably the same) was brought to me on the 30th of that month from Hungry Bay. Lieut. Hoegood, of the 97th Regiment, shot one of a pair in a potato-field near Devonshire Bay on the 8th May, 1875. I imagine this species has occurred more frequently than the records tend to show, not having been distinguished from its larger-billed congener.

Coccyzus americanus, Yellow-billed Cuckoo.—A few specimens only are recorded previous to the 9th October, 1849, when an extraordinary invasion took place. Thousands of these birds suddenly appeared in all parts of the islands, most of them departing as suddenly the next day. A few were seen in April, 1852. They were numerous from the 12th to the 15th of October, 1874, and a few remained behind for some time. I shot one near Devonshire Bay, in a potato-field, on the 7th November: its stomach (like that of other specimens examined) was full of green caterpillars collected from the leaves of the potatoes. I was very angry with myself for having killed the poor bird when doing such good service.

Sphyrapicus varius, Yellow-bellied Woodpecker.—Of this species Major Wedderburn says:—"In general not very common. I first saw it in December, 1847; again in November, 1848; and in April, 1850, a great many suddenly appeared, several of which I shot. Many of the palmetto trees are bored by this bird. It breeds in Mr. Ballinghall's garden every year, and I should think that a few also breed in holes in the large trees at Brackish

Pond ; and in some of the other large swamps." Three examples occurred during my stay, but I could not ascertain whether they bred or not in 1875. I don't think they did so in Brackish Pond, where I kept a careful watch for them. Mr. Bartram has about a dozen specimens, scarcely two of which are alike, so variable is the plumage of the species. They are all in immature dress, with the crimson patches more or less replaced by mottled gray, but all possess the characteristic "yellowness" which distinguishes the bird from nearly all the other American *Picidae*.

Colaptes auratus, Golden-winged Woodpecker; Flicker.—The only specimens ever obtained were shot by officers of the 61st Regiment in Devonshire Marsh, as my friend Mr. J. M. Jones informed me. One or two were shot, in 1871 I think, but no others are on record.

Otus Wilsonianus, Long-eared Owl.—This near ally of our European *O. vulgaris* has occurred frequently, but irregularly, during the winter months, generally on the highest part of the islands, near the lighthouse. One in Mr. Bartram's collection was caught alive at Mount Langton a few years ago. This bird did not, to my knowledge, visit Bermuda during the year 1874-5.

Brachyotus palustris, Short-eared Owl.—Not so frequent a visitor as the preceding ; but, like it, appearing in the autumn and winter months, and usually seen on the south side, near the lighthouse. The attraction presented by that part of the islands would appear to consist of a plentiful supply of mice, which inhabit the sandy scrub-covered hills near the shore.* Mr. Bartram has two specimens of this Owl, and I obtained two myself during my stay—one at the Sand Hills, and another in Warwick Swamp.

Syrnium nebulosum, Barred Owl.—Mr. Hurdis observed one of these birds on the 2nd April, 1851.

Nyctea nivea, Snowy Owl.—Major Wedderburn observes (Nat. in B., p. 25) :—Lieut. Fayrer, R.N., shot two specimens at Boss's Cove in the autumn of 1843. Another, a fine female specimen, was shot by a person named Llewellyn, at Ireland Island, on the 29th November, 1853: this bird was only wounded, and when examined by Mr. Hurdis, on the 13th December following, appeared lively and well. When being fed, it frequently erected a little tuft of feathers on each side of the head, so as to resemble

* I saw many of these little quadrupeds, but never succeeded in capturing one, to my great regret, as I fancy they differed from the ordinary *Mus musculus*.

small horns." No other examples are recorded. [Two frequented the islands in the autumn of 1875. One of these was shot by Lieut. Tallents, 20th Regiment; the other escaped, though it remained two months or more.—H. D.]

Surnia ulula, var. *Hudsonica*, Hawk Owl.—A single specimen was "seen by Col. Drummond at St. George's, quite close to him, on a Sunday afternoon, otherwise it would have been shot" (Nat. in B., p. 55).

Nyctale acadica, Acadian Owl; Saw-whet.—A rare straggler. Major Wedderburn's notes contain all the information we possess. He says (Nat. in B., p. 25):—"Only one specimen, found on the 12th January, 1849, sitting inside the muzzle of one of the guns at Ireland Island by an artilleryman. It is to be hoped that the said gunner has more nerve when working a gun than he displayed on finding the little bird, being afraid to catch it, as he said 'it glow'dred at him.' It was caught by a man of the 42nd, and lived in my room for several days, getting quite tame. At night it always became restless, and finally killed itself against the wires of the cage. Mr. Harry Tucker saw another some short time afterwards, in a cave on the south shore."

Circus cyaneus, var. *Hudsonius*, American Marsh Hawk.—Whether this bird be a good species, or merely a climatic subspecies, race, or variety, I am at a loss to understand, so conflicting are the opinions of naturalists on the question. I have, however, Dr. Coues's authority for the name above assigned to it, which designates it as a geographical variety of our European Hen Harrier, *C. cyaneus*. It is occasionally seen in Bermuda in the autumn. One was shot by Mr. Pooley, 20th Regiment, in 1845, and one by Mr. Hurdis in December, 1851. Mr. Bartram has a male and two female specimens. As might have been expected, he was somewhat unwilling to believe that they were of the same species. A female was picked up dead in Warwick parish in November, 1874, by a "coloured" boy, who showed it to me, too late for preservation unfortunately.

Accipiter fuscus, Sharp-shinned Hawk.—Major Wedderburn has a specimen in his collection, shot near Penniston's Pond on the 23rd February, 1853, and Mr. Bartram has another, shot by himself near Stock's Point.

Astur atricapillus, American Goshawk.—I examined two specimens in Mr. Bartram's collection, the only ones that have occurred.

One is a fine adult, shot on Somerset Island some twelve years since; the other is in immature plumage, with the close barring of the under parts only just commencing to appear on the thighs.

Falco communis, Peregrine Falcon.—This bird, which Bonaparte separated from the European “*communis*” or “*peregrinus*,” under the name “*anatum*,” has now been restored, on the authority of Schlegel and other distinguished ornithologists, to its original position. It is a rare visitor to Bermuda. One was killed in 1846 by Dr. Cole, 20th Regiment. Another was wounded and taken alive by a coloured man on the 1st February, 1850, and presented to Mr. Hurdis, who kept it for several months. A third was also captured, after a revolving gale, at the dockyard. I never saw this grand bird alive while I was quartered in the islands, but I examined a specimen in Mr. Bartram’s collection, and another, in the flesh, shot by Lieut. Tallents, 20th Regiment, at Peniston’s Pond, on the 10th October, 1874.

Falco columbarius, Pigeon Hawk.—A frequent visitor, always in the autumn and winter months. Hardly a year passes without a few stragglers appearing. I saw one flying over Devonshire Swamp on the 2nd November, and obtained a beautiful male from the same place on the 3rd December, 1874:

Falco sparverius, American Sparrowhawk.—Only one recorded, shot near the Sluice Ponds on the 9th December, 1853, while in the act of pouncing on some chickens (Nat. in B., p. 24).

Buteo borealis, Red-tailed Buzzard; Hen Hawk.—Mr. Bartram has one specimen, an adult with fine chesnut tail, shot at Baylis’s Bay, about twelve years ago, by a man named Hollis, who is still residing in the islands. About the same time a nest of this species containing young is said to have been found in the cliffs of Harrington Sound, but what became of this nest and its occupants history sayeth not. I see no reason to doubt the story, especially as it is corroborated by an authentic specimen of the bird; but I unfortunately did not see the man Hollis, as I meant to have done. Large hawks are mentioned as common in Bermuda by the old historians, and this species may have once been resident and numerous. The high cliffs on the north side of Harrington Sound offer great attractions to raptorial birds.

Archibuteo lagopus, var. *Sancti-Johannis*, Rough-legged Buzzard.—A dingy old specimen in Mr. Bartram’s possession, covered with dust and cobwebs, and with all the quills and tail-feathers

niobled off short by rats, appears to belong here. Its measurements and fully-feathered tarsi are, I think, unmistakable. The bird was originally dubbed an "Eagle." It was shot near Prospect Camp by a medical gentleman, who gave it to Mr Bartram.

Pandion haliaetus, Osprey.—The movements of this cosmopolitan species in Bermuda are somewhat mysterious. In 1874 I saw the first on April 22nd; in 1875 one was observed on the 17th of that month. During May they are often to be seen, especially about the Great Sound, along the south shore, and at Peniston's Pond; but whether these are old or young birds I cannot say, as I religiously abstained from shooting one. During the summer months I lost sight of them, though I believe they were occasionally observed; but in autumn I met with one or two specimens. On May 2nd, 1875, I watched for some time two of these fine birds circling over Devonshire Swamp. This gave rise to the question, "Do they breed here?" I took eggs in Southern Spain, slightly incubated, on March 29th, and, there being but little difference of latitude between the two places, it would be only natural to suppose that, if they were going to nest in Bermuda, they would have arrived earlier. Probably, therefore, they are young birds from early nests on the southern continent, or Gulf of Mexico. I could hear nothing of nests in former years. I must leave the question to be solved by future visitors to the islands.

Haliaëtus leucocephalus, White-headed Eagle; Bald Eagle.—"Uncle Sam's bird" has only once been known to favour Bermuda with a visit. He was not obtained, but was well seen by Mr. Hurdis and by other witnesses.

Cathartes aura, Turkey Buzzard.—A male of this ill-favoured species appeared during the yellow-fever epidemic of 1853. Was its coming accidental, or did some marvellous instinct lead it there? It was shot in the latter part of November, and subsequently examined by Mr. Hurdis.

Ectopistes migratorius, Passenger Pigeon.—Major Wedderburn records that one was seen by Dr. Cole; but no date is given. Mr. Bartram shot one as he lay on a sofa in his museum with "broken-bone" fever, on October 24th, 1863: it was sitting on a tree close to his house. My friend Mr. J. M. Jones was informed by Mr. J. H. Trott that, previous to 1831, small parties of these birds were resident in the islands, breeding in the caves at Walsingham and along the south shore; but I am inclined to think, with all

deference to the authority given, that these must have been escaped "Blue Rocks" from dovecotes in the islands.

Zenaidura carolinensis, Carolina Dove.—Specimens are recorded in 'The Naturalist in Bermuda.' One was shot by Capt. Harvey on March 20th, 1850; and another was taken alive at Spanish Point on October 30th, 1854. I saw one at the Sand Hills on November 5th, 1874. A small flock frequented the fields near Whale Bay all through the winter of 1874-5, and specimens were obtained, one by Lieut. Hussey, R.E., on February 11th, 1875. I hear from Lieut. Denison that two have been seen as late as June 20th last. Can they have remained to breed? These pretty birds are fond of associating with the next species, feeding with them on the newly-turned fields—conspicuous when the flock is disturbed by their larger size and long tails. Their flight is very strong and rapid.

Chamaepelia passerina, Ground Dove.—Resident and abundant. It nests twice, laying two white eggs, '85 in. by '64 in., in a small, flimsy construction of twigs and cedar bark, generally placed on the bushy horizontal bough of a cedar tree, from eight feet to twenty feet above the ground. The earliest eggs I saw were on April 4th, the latest on June 27th; but there are instances of its breeding even in the winter months. When disturbed from its nest it falls like a stone to the ground, where it commences to flutter about, as if in the agonies of death, to deceive the intruder. Should the latter be taken in by the good acting of the poor little bird, and attempt to seize her, she shuffles away along the ground just out of reach, further and further from her nest, and, when she thinks her home is safe, away she dashes into the trees with a joyful "whir-r-r-r" of relief. My terrier used to be completely "sold" in this way, and had many an exciting but fruitless chase after the little doves. The "coloured" people have an absurd superstition about this bird, and say that when it utters its "coo-oop" (this is an extraordinarily loud and so orous call for so small a bird, and can be heard a long distance), it is scratching up the ground for somebody's grave! The habits and mode of feeding of the species are too well known to need description. The male is larger, and has the sides of the neck and the under parts of a much warmer purplish red than the female.

(To be concluded in the November number.)

ON THE FORMER NESTING OF THE SPOONBILL
IN THE COUNTY OF SUSSEX.

BY THE EDITOR.

ALTHOUGH the Spoonbill, *Platalea leucorodia*, is generally classed amongst the rarer British birds, instances of its occurrence in this country in spring and autumn are not infrequent. This is more particularly the case in the eastern and south-eastern counties of England, where scarcely a year elapses without several of these birds being seen, and most of them unfortunately shot. Occasionally they arrive in small flocks, but are more often observed singly or in pairs.* This return year by year, with a certain amount of regularity, seems to indicate a lingering inherited impulse to revisit the spots where in former days their ancestors not only reared their young in safety, but were protected the while by Act of Parliament.

Records, however, of the former nesting of the Spoonbill in this country are extremely rare, and putting aside certain old Statutes which provided for the protection of this species amongst others during the breeding season, and from which it is therefore to be inferred that the bird once nested here, I have not until recently met with any direct evidence on the subject, except that of Sir Thomas Browne, the celebrated physician of Charles the Second's day.

The testimony of this trustworthy observer on the subject is very clear. In his 'Account of Birds found in Norfolk,' written about the year 1668,† he particularly mentions, "The *Platea* or *Shovelard* which build upon the tops of high trees," and says, "They have formerly built in the Hernery at Claxton and Reedham; now at Trimley, in Suffolk. They come in March, and are shot by fowlers, not for their meat, but the handsomeness of the same; remarkable in their white colour, copped crown, and spoon or spatule-like bill."

* In 1850 half-a-dozen Spoonbills arrived in Sandwich Haven during the first week in June, and afterwards betook themselves to Wingham Marshes, where several were eventually shot. (See 'Zoologist,' 1850, p. 2853.) The following year, on the 3rd October, three were killed out of a flock of six which had alighted in a field near Hailsham. (See 'Zoologist,' 1851, p. 3278.)

† See Sir Thomas Browne's Works. Ed. Wilkin, vol. iv. pp. 313—324.

His description of the bird leaves no doubt as to the species intended.

Willughby, a contemporary and correspondent of Sir Thomas Browne, has described, in his 'Ornithology,' a young Spoonbill "taken out of the nest," and although he has not stated where the nest was found, it may well have been one of those referred to as being in existence at Trimley in Suffolk about four years before Willughby's death, which occurred in 1672.*

The record to which I now desire to direct attention is a century older, and, so far as I am aware, has not hitherto been brought to the notice of ornithologists.

In a MS. Survey of certain manors in Sussex, "taken by commandemente of the Duke of Norfolk," and "begonne the xxvth daye of September, Anno xij^o Eliz. R." (1570), the following memorandum appears:—

"M^p that w^tbin half a furlonge of Halnaker parke pale on the west side thereof lyeth a parke called Goodwoode Parke; and by the northeast parte thereof lyeth one other parke called Shelhurst Parke, distaunte from Halnaker pale one quarter of a myle. And on the north side of that pale lyeth one other parke called Estden, halfe a myle dystaunte. In the woods called the Weestwood and the Haselette, *Shovelers* and *Herons* have lately breed, and some *Shovelers* breed there this yeere."

This curious MS., consisting of fourteen folios, is in the possession of Mr. Evelyn P. Shirley. The Survey in question, which was made by "Robt^e Harrys and John Dobbes, servauntes to the said Duke," is noticed in the ninth volume of the 'Sussex Archæological Collections' (p. 223), but the contributor, the late Mr. M. A. Lower, not being an ornithologist, has made no comment on the passage just cited.

Dallaway, in his 'History of the Western Division of the County of Sussex' (vol. i., p. 174), thus describes the *locus in quo*:—

"East Dean is so called with reference to West Dean, from which it is disjoined by Singleton. It is a parish of larger

* Sir Thomas died exactly ten years later. Willughby speaks of him (*op. cit.*, p. 286) as "my honoured friend Sir Thomas Browne of Norwich, a person deservedly famous for his skill in all parts of learning, but especially in Natural History."

dimensions, and nearly similar description, in point of soil and situation, in a narrow valley between the headlands formed by the range of downs by which this district of the county is intersected. It contains 4682 acres 2 roods and 33 perches from actual measurement,* with down and forest land in the same large proportion; and abounds in beautiful groves of beech wood. The confines are Singleton on the west, Cocking and Heyshot on the north, Up-Waltham on the east, and Eastham on the south. The village lies on the western extremity of the parish, about seven miles from Chichester [and the same distance south by east from Midhurst].

"Domesday includes this parish in Silleton, and gives no distinct description of it. In the 23rd of Henry II. the manor was held by William de Albini, Earl of Arundel, of the King *in capite*, as of the honor of the Castle of Arundel. It passed by partition, on the demise of Earl Hugh, to John Fitz Alan, whose descendants made a large park with a mansion there; and in the 18th of Henry VI. it was found to have been a member of the jointure settled upon Beatrice, relict of Thomas, Earl of Arundel, who died in 1414 without issue. Having devolved to John, Lord Lumley,† it was by him for the first time aliened by sale, in 1589, to Peter Garton, of Gray's Inn, London, who was afterwards knighted.

"Selhurst Park, containing 886 acres, descended to Philip, Earl of Arundel; and in 1797 was transferred by sale to the late Charles, Duke of Richmond, by the late Charles, Duke of Norfolk.

"In the family of Garton, the manor appears to have been vested considerably above a century, when it was inherited by Garton Orme, Esq., of Peterborough, in pursuance of the will of the last William Garton, Esq., who died without issue.

"In 1752, in consequence of an Act obtained in 1750 for that purpose, the manorial property was sold to Sir Matthew Fetherstonehaugh, Bart., as held of the paramount manor of Stanstede,‡ who exchanged it with Charles, the late Duke of

* Arable, 1896 acres 2 roods 2 perches; Down, 2076 3 roods 29 perches; Woods, 691 acres 32 perches.

† An ancestor of the present Earl of Scarborough.

‡ Sold for £12,000. See also Horsfield, 'History and Antiquities of the County of Sussex,' vol. ii., pp. 79, 80.

Richmond, for the estate of Lady Holt Park, in the parish of West Harting; and it has passed as the other settled estates of that noble family. Various small farms have been subsequently added to it."

That the species referred to in this Survey is the Spoonbill (*Platalea leucorodia*) and not the Shoveller Duck (*Anas clypeata*) seems clear, for several reasons. In the first place, "Shoveller," "Shoveler," "Shovelard," and "Sholarde" are so many forms of spelling the old name for that species, as clearly identified by Sir Thomas Browne. In the second place, the birds in question were nesting "in a wood," where the Shoveller Duck would not be found at any season. And further they were breeding in company with Herons, a habit not uncommon with the Spoonbill as formerly observed in Norfolk, and elsewhere.*

As a curious connecting link between these two records, it may be mentioned that Sir Thomas Browne, when writing of the "hernery" in Norfolk, knew an old man who might have seen the colony in Sussex, for he "wayted on the Earle of Leicester when Queen Eliz. came to Norwich, and told mee many things thereof."† Now Queen Elizabeth visited Norwich in 1578, or eight years after the date of the Sussex Survey.‡

In those days, it appears, Spoonbills were esteemed good eating, and were served up to table with many other fowl, which are now discarded as little better than rank carrion.

Amongst the Privy Purse Expenses of King Henry the Eighth,

* "In a certain grove, at a village called Sevenhuys, not far from Leyden, in Holland, Spoonbills build, and breed yearly in great numbers, on the tops of high trees; where also build Herons, Night-ravens (Night Herons), Shags, Cormorants, &c. In this grove every sort of bird (as they told us) hath its several quarter, where they build all together. When the young ones are ripe, those that farm the grove, with a hook on the top of a long pole, catch hold of the bough on which the nest is built and shake out the young ones, but sometimes nest and all down to the ground."—Willughby, 'Ornithology,' p. 289.

+ Letter to his son Edward, dated 1st November, 1650 (Works, vol. i., p. 290). In this letter mention is made of a poor woman, who was then living, at the age of 105, and one John More, who had recently died at the age of 102.

‡ "She came on horseback from Ipswich, by the high road to Norwich, in the summer time; but shee had a coach or two in her trayne. She rid through Norwich, unto the bishop's palace, where she stayed a weeke, and went sometimes a hunting on horseback, and up to Moshold (Mousehold) Hill often, to see wrestling and shooting" (tom. cit., p. 289).

between the years 1529 and 1532, the following entry occurs in November, 1531:—

"Itm. the x daye of Novembr, paied to a s'vnt of
my lorde Cobhams, in rewarde for bringing of
Shovelards to the King's grace iiijs. viii d."

For this sum the man may perhaps have brought nine birds, for we learn from another source that the value of a "Shovelard" in those days was sixpence. In the Earl of Northumberland's Household Book, which contains entries made between the years 1512 and 1525, the following occurs:—

"Item. Sholardes to be hadde for my Lordes owne Mees at
Pryncipall Feestes, and to be at vj d. a pece."

Not only was the bird eaten "at pryncipall feestes" in those days, but during the breeding season it was protected by Statute like other wild fowl.

In 1534 an Act of Parliament was passed entitled "An Act to avoide destruction of Wilde fowle," whereby, amongst other things, it was enacted that between the first day of March and the last day of June, "no maner of person or persons shall presume by day or by night, willyngly to withdrawe, purloyne, take, distroye or convey any maner of egges of any kinde of wildfowle, from or in any nette, place or places, where they shall chaunce to be laide by any kinde of the same wildfowle, upon peine of imprisonment for one yere, and to lese and forfeit for every egge of any Crane or Bustarde, so distroyed, purloined, withdrawne, conveide, or taken from any nest or place xx. pence, and for every egge of every Bittour, Heronne or *Shouelarde* viiid., and for every egge of every Malarde, Tele, or other wildfowle, one penie."

An attempt has been made by recent legislation to afford the Spoonbill that protection during the breeding season which was formerly accorded to it by ancient statute; but it is feared that this protection has come almost too late. So long an interval has elapsed since any nest of this bird has been seen in England, and so many changes in the progress of agriculture have affected its former haunts, that the most ardent ornithologist can scarcely hope to see this fine bird re-established in its old position, and breeding in our heronries. On this account any record of its former nesting in this country is worth noting.

ORNITHOLOGICAL NOTES FROM NORFOLK.

BY HENRY STEVENSON, F.L.S.

JANUARY, 1877.

ORNITHOLOGICAL occurrences, worthy of record, were unusually scarce during the first half of the present year, its commencement being characterized by an unseasonable mildness and excess of rain, alike prejudicial to the prospects of the sportsman and collector; whilst, later on, the penalties now in force under the "improved" Wild Fowl Protection Act have had a salutary effect in checking the slaughter of migratory species, and with a few notable exceptions, including an adult female Black Stork, a White Stork, and an immature Spoonbill,—all from the vicinity of Yarmouth,—I know of no "casualties" infringing upon the law, in Norfolk, either inland or on the coast.

Except in the fens of the south-western part of the county, Norfolk did not suffer to any great extent from the floods, which in January covered so large an area in Lincolnshire, Huntingdonshire, and even parts of Suffolk, but about Feltwell and Lakenheath the amount of water "out" caused great loss to the farmers; the seed-corn rotting in the soddened soil, mills stopped and many hands thrown out of employ, and still, day after day, the same leaden sky, and the rain came down, with but brief intervals of respite, till all was depression and slush! At this time, though the rivers were full, the marshes of the eastern or "Broad" district of the county suffered but little, owing to the extreme lowness of the tides at Yarmouth and adjoining parts of the coast; but not so at the close of the month, when the fearful gales on the 29th and 30th, which caused such sad loss of life amongst our smacksmen in the North Sea, broke upon our shores, and lunar influences combined with the hurricane to raise the most destructive tide that has been known here for more than thirty years. The tidal streams which empty themselves into the sea at Yarmouth and Lowestoft overflowed their banks and inundated an immense tract of marshes, a considerable portion of which still remained submerged up to the middle of March, the shallow flood having a special attraction for Black-headed and Common Gulls and immense flocks of Lapwings. At Salthouse the tide broke through the sea embankment, and poured itself over the once-famous marshes at that spot, a former haunt of the Avocet.

Wild-fowl.—Owing to the above causes, and to the extreme mildness of the season, the gunners, professional and amateur, had a bad time of it. Amongst the rarer specimens that came under my notice during the month were an adult male Goldeneye (killed near Stalham), three fine Sheldrakes and a good old male Goosander, with several immature Red-breasted Mergansers. About the 16th an adult Gannet, storm driven, was taken inland at East Ruston, and another was killed at Cley in the following week.

Black-throated Diver.—A young bird of this species was sent into Norwich about the first week in the month; and another specimen, in winter plumage, was shot on the mill-pond at Hempstead, near Holt, on the 3rd, which had a dozen small perch in its stomach, all under four inches long.

Sclavonian and Red-necked Grebes.—One of the former was shot at Paston on the 1st, and one of the latter at Yarmouth about the same time.

Bittern.—One killed near Yarmouth on the 15th; and towards the end of the month another was seen on Hoveton Broad on several occasions, but it does not appear to have remained much later.

Rough-legged Buzzard.—One killed at Yarmouth during the first week of the month; another at Hempstead, on the 8th, the stomach containing the remains of a Pheasant and a Chaffinch; and a third, which had been some time dead, was picked up at Northrepps, near Cromer, on the 29th.

Mealy Redpolls.—These birds, abundant in the early part of the winter, were still met with during the month of January. On the 9th I received specimens for my aviary, one of which had a very rich rose-tinted breast.

Merlin.—A single bird was seen at Northrepps on the 5th.

Pheasant.—A hen Pheasant was shot at Northrepps on the 10th, with spurs half an inch long, but showed no signs of male plumage.

Kite.—The occurrence of this once-familiar species is now-a-days worthy of special notice. On the 7th an undoubted specimen was seen by Mr. J. H. Gurney soaring above his residence and garden at Northrepps; and on the 18th I saw, in the flesh, a Kite which had been killed two or three days before at Beeston, near Cromer,—probably the same bird. A claw was missing from one foot, and something like rabbit's down adhered to the torn end of

the toe, though dry and healed. The unusually worn state of the tail-feathers and primaries, in connection with the injured foot, seemed to indicate a narrow escape from a steel fall-trap, and the bird was in poor condition. Another is said to have appeared in the same locality at the same time, but was not procured.

FEBRUARY.

Black-headed Gulls.—As an evidence of the extreme mildness of the weather at that time, a flock of about a hundred of these gulls were observed, on the 6th of this month, hovering over their usual nesting-haunt at Scoulton Mere; but, though seen in smaller numbers on the following day, they did not remain. I know of no record of their appearance at this spot so early, though occasionally a few have made their appearance by the middle or end of February, the usual date of return being between the first and second week in March. This mild period, however, was succeeded, on the 27th, by a heavy fall of snow and a severe frost.

MARCH.

Water Rail.—On the 23rd a bird of this species was picked up dead at Northrepps, under the telegraph-wires, most probably migrating, as no suitable haunt for it exists within several miles.

Gray Shrike.—One was shot at Hunstanton about the second week in this month, in the same place where a specimen was procured the previous year.

Norfolk Plover.—An unusually light-coloured bird of this species and under-sized as well, was shot, on the 16th, at Shimpling, near Diss.

Hawfinch.—Two killed this month at Wacton and Hemblington, and two or three were seen about Feltwell.

APRIL.

Lesser Spotted Woodpecker.—About the 13th an adult male of this species was shot at Elmham.

Common Buzzard.—One trapped at Northrepps on the 14th, and another was seen going south, at a great height, on the 27th.

Raven.—A single bird seen at Northrepps, going inland.

MAY.

Raptorial Migrants.—Mr. J. H. Gurney, Jun., has already recorded (p. 260) the appearance of a Kite and two Buzzards at

Northrepps on the 2nd May, all passing southward, at a considerable height; and on the 27th, in the same locality, a Buzzard was seen pursuing the same course, and another on the 30th. On the 5th a Common Buzzard, a very dark bird, was shot at Sprowston, near Norwich, and on the same date a large white-headed hawk, supposed to be a Marsh Harrier, flew over the Selbrigg pond at Hempstead, and excited much alarm amongst the fowl. As late as the 26th a Short-eared Owl was seen at Northrepps, and a bird of this species, flushed from some rough ground in the same parish on the 13th April, flew out to sea, after circling round at a great height. The note by Mr. J. H. Gurney, in 'The Zoologist' for May last (p. 228), respecting Partridges attacked on the ground by a Short-eared Owl is somewhat similar to the fact recorded by myself, in 'The Zoologist' for 1876 (p. 4896), of one of these Owls being taken in the act of killing a Lapwing. One instance occurred in March, the other in April. Would not rats and mice be less accessible at that time than, during the autumn and winter, in the closely-mown marshes? Two Ospreys were also killed in this county about the same date (May 12th)—one, an adult bird, at Morston, and a younger specimen on Breydon.

Cuckoo in Reddish-brown Plumage in Spring.—Mr. J. H. Gurney, Jun., recently referred, under the above heading (p. 230), to the occasional appearance of individuals of this species, on their return to this country in spring, in a peculiar ruddy state of plumage, differing much from the ordinary autumnal tints of the young birds. I recently examined a young specimen of this kind, which was shot in May, near Cantley, on the River Yare, and it was, certainly, the most vivid in colouring of any I have seen.

The Green-backed Porphyrio in Norfolk.—I am glad to find that Mr. Gurney has corrected my note (p. 228) on the *Porphyrio* killed at Tatterford, in this county, last October, and identified it as *P. smaragdonotus* and not *P. hyacinthinus*. I had not seen the bird when I wrote on the information of a friend. I have since learnt that one of the specimens kept in confinement at Northrepps by Mr. J. H. Gurney, Jun., has escaped; but as yet it does not appear to have turned up again, either as a genuine migrant or an acclimatized vagrant.

Little Owl.—On the 9th of this month one of these small Owls (*Carine noctua*) was brought to me in the flesh, having been shot

by a gamekeeper at Haverland; but having since ascertained that several Owls of the same species were turned off, not long since, on Lord Kimberley's estate at Wymondham, it is impossible to decide if this individual has strayed from this neighbourhood or has occurred as a voluntary migrant.

Late Occurrence of Fieldfares.—About the middle of May a large flock of Fieldfares appeared at Sheringham, no doubt coming from the south, and remained about the park for several days. After the main body had left, a straggler was seen, by Mr. H. M. Upcher, on June 2nd.

Osprey.—About the close of the month an Osprey was observed at Hoveton, perching on some oaks on the lawn of Mr. Blofeld's residence; and a few days later, one—probably the same—was seen at Coltishall.

ARRIVAL AND DEPARTURE OF MIGRANTS, AS OBSERVED CHIEFLY IN THE VICINITY OF CROMER AND NORWICH.

- March 5. Hooded Crow, departure first observed at Northrepps; on the 27th a considerable flock took their departure; seven seen at Northrepps on the 23rd April; and three on May 16th.
- ,, 28. Chiffchaff heard at Northrepps.
- April 4. Two Willow Warblers seen at Northrepps.
- ,, 6. Blackcap (male) seen at Northrepps.
- ,, 8. House Martin seen at Coltishall, and Ring Ouzel at Sheringham.
- ,, 8. Nightingale heard at Thorpe, near Norwich; and in neighbouring localities on the 10th and 12th; at Keswick on the 13th.
- ,, 9. Redstart seen at Keswick, and at Norwich on the 11th.
- ,, 14. Cuckoo heard at Northrepps.
- ,, 20. Sand Martin seen at Gunton
- ,, 21. Two Swallows seen at Keswick.
- ,, 23. Garden Warbler seen at Norwich.
- May 6. Turtle Dove heard.
- ,, 7. Hobby seen at Northrepps.
- ,, 8. Wood Warbler seen at Northrepps.
- ,, 15. Swifts first seen at Cromer, and at Norwich on the 26th.
- ,, 17. Spotted Flycatcher seen.
- ,, 22. Red-backed Shrike seen at Cringleford, and at Northrepps on the 25th.

ARCTIC MOLLUSCAN FAUNA.

By H. W. FEILDEN, C.M.Z.S., F.G.S.,
Naturalist to the late Arctic Expedition.

Two papers have lately been published, one in 'The Annals and Magazine of Natural History,' "On the Recent Mollusca collected during the Arctic Expedition of 1875-76," by Mr. Edgar A. Smith; the other, "On the Post-tertiary Fossils from Grinnell Land," by Dr. Gwyn Jeffreys, read at the Plymouth meeting of the British Association, 1877. I am much indebted to both of these gentlemen for their determinations of the species brought back by the Arctic Expedition, and in their able hands I leave the nomenclature. I must, however, dissent from a portion of the general views expressed by both. Mr. Smith writes:—"It is somewhat disappointing, considering that unexplored regions were searched, that only a single new form was procured. The entire collection consists of thirty-four species. This may appear a very small number; but the difficulty experienced in collecting in such northern climates in a great measure accounts for such small results. It by no means proves that there is any great scarcity of molluscan life in the regions investigated. In all probability further research will discover many more known forms, thus showing that the fauna northward does not change very materially from that existing further south in Davis Strait." Dr. Gwyn Jeffreys writes:—"I cannot help sharing Mr. Smith's expression of disappointment with the conchological results of the Expedition. The number of post-tertiary, as well as of recent, species is very scanty. In analogous or apparently similar cases of so-called 'glacial' and raised sea-beds in Great Britain, Scandinavia, and Canada, which I have examined, I collected in two or three hours a greater number of fossil species than those procured in the Expedition."

I cannot help thinking that the feeling of disappointment experienced by both of these naturalists arises from their not having taken into due consideration the physical conditions appertaining to the area from whence these collections were derived, and also not having sufficiently estimated the results of prior expeditions to the same quarter of the globe.

In most of these former voyages it has been the custom to include in the Natural History appendices lists of animals and specimens procured in Davis Strait and Baffin Bay. It appeared to me that such a procedure was not in the interests of research. Most certainly the lists obtained by the Expedition of 1875-76 might be greatly enlarged if they included all species observed after entering Davis Strait (the latitude of the north of Scotland); but believing that the true interests of biological science would be better served by omitting from our collections all specimens made during a hasty voyage and superficial examination of the fauna of regions already more or less investigated, I confined the collections reported on by myself, and submitted to specialists, to those made after entering Smith Sound, or, generally speaking, to the north of the seventy-ninth parallel of latitude. Our previous knowledge of the regions north of this degree, on the American side of the Arctic Circle, was based entirely upon the observations of our American predecessors, the illustrious arctic travellers Kane and Hayes; and to those of the United States Polar Expedition, under the command of the late Captain Hall, in the 'Polaris.'

Notwithstanding the obstacles encountered by these observers, arising in a great measure from the inefficiency of their equipment, the excellence of their work is not to be gainsaid. Kane's volumes are replete with facts in reference to the Natural History of Smith Sound, though the author warns us in his preface that his book "is not a record of scientific investigation." Hayes, during his journey along the shores of Grinnell Land, one of the most remarkable on record, collected and brought back a series of geological specimens,* which at the time represented the most northern palaeontological collection in existence; and our much larger collections from the same localities entirely bear out his investigations. The collection of invertebrates,† made by Hayes at Port Foulke, embraced—Crustacea, 22 species; Annelida, 18 species; Mollusca, 21 species; Echinodermata, 7 species; Acalephæ, 1 species; and it is recorded by Dr. Stimpson, in the Proceedings of the Academy of Natural Sciences of Philadelphia, for May, 1863, that "the number of species collected by Dr. Hayes is greater than that brought back by any single expedition which has yet visited those seas, as far as can be judged by published accounts."

* Hayes, 'Open Polar Sea,' p. 341.

† Id. p. 388.

The biological results of the 'Polaris' Expedition have not yet been published *in extenso* by Dr. Emil Bessels, whose collections embraced the area up to lat. 82° N.; but sufficient can be gleaned from the official narratives published by the United States Government, and from a communication addressed to the Geographical Society of Paris, by Dr. Bessels, in 1874, published in March, 1875, to show that his Expedition left little unrecorded from the regions visited. A complete list of the Mollusca collected does not appear to have been published; but I venture to surmise that ours will be a considerably fuller list, owing to the many more opportunities we had of dredging.

The dredgings made in Northumberland and Wellington Sounds, by the Expedition under the command of the late Sir Edward Belcher, produced forty-five species,* from an area lying between lat. 75° and 77° N. Hayes procured twenty-one species between lat. 78° and 79° N. Our collections embrace thirty-five species, from between lat. 79° and 82° 30' N.

Dr. Gwyn Jeffreys gives one hundred and twenty-two species of Mollusca as procured in Davis Strait, during the cruise of the 'Valorous'† in 1875; but his valuable report on the biology of that cruise does not give the distribution in latitude, of the species found in Davis Strait, between the parallels of 60° and 70°. It would be extremely interesting if we were to find, as I apprehend we should, that a diminution of species occurs with each degree of northing, and would bear out my belief that our collections represent very fully and fairly the molluscan fauna between lat. 79° and 83° within the American Arctic Circle.

Mr. Edgar Smith considers it not unlikely that further research will show that the molluscan fauna northward does not change materially from that existing further south in Davis Strait; but I venture to say that this can hardly be expected, for more than twenty degrees of latitude separate the southern limit of Davis Strait from the regions in which our collections were made; and it would be truly remarkable if a fauna should remain unchanged through 1200 miles of latitude—a distance as the crow flies equal to that between Lerwick and Lisbon, or between the British Channel and the Canary Islands. Had our researches been merely confined to the dredgings from the area of Smith Sound and

* 'Last of the Arctic Voyages,' vol. ii., p. 392.

† Proc. Royal Soc., No. 173, 1876.

northward, owing to the difficulties encountered in finding sufficient spaces of open water when the vessels were stationary, I should not have ventured to place my views in such direct opposition to those announced by Dr. Jeffreys and Mr. Smith.

The examination, however, of the recent sea-beds, which extend from the present sea-margin to a height of not less than a thousand feet, afford additional proof of the correctness of my views. These beds are being deposited at the present day under precisely the same physical conditions as those now elevated above the sea-level, which give satisfactory evidence that the molluscan fauna of the past, represented by these post-tertiary deposits, is precisely that now existing in the adjacent sea. At least forty or fifty spots in Grinnell Land and Hall Land, where these beds occur, were carefully examined by independent observers, especially by Mr. Hart, Dr. Moss, Lieut. Parr, Lieut. Egerton, and myself; the sands and mud were also submitted frequently to microscopical investigation. The results of these independent examinations may be briefly summarised as follows:—Four species of *Conchifera* were very generally distributed as fossil forms, usually they occurred in very considerable numbers; these were *Pecten grœnländicus*, *Astarte borealis*, *Saxicava rugosa*, and *Mya truncata*. The fossil *Gastropoda* were excessively rare; after days of searching we met with only a few specimens of *Trichotropis borealis*, one or two of *Buccinum hydrophanum*, a single *Trophon clathratus*, and a few *Pleurotoma tenuicosta*, *P. exarata*, and *P. Trevellianum*. Our dredgings showed that a nearly similar disproportion existed in the number of individuals between the recent *Conchifera* and *Gastropoda*. I deem, therefore, that our knowledge of the molluscan fauna of the area under discussion was acquired by us under most favourable circumstances, large deposits of recently-emerged sea-bed were laid open to our investigations, and the result showed a remarkable correspondence between their fauna and that of the neighbouring sea. The not unnatural conclusion I have arrived at is that the recent and post-tertiary faunas combined, show very accurately the present condition of the molluscan fauna of Smith Sound and northward to the eighty-third degree.

I can well understand, as Dr. Gwyn Jeffreys writes, that he has collected in the "so-called glacial" and raised sea-beds in Great Britain, Scandinavia, and Canada, in two or three hours, a greater number of fossil species than those procured in the Expedition,

for I have not unfrequently done the same; yet I am satisfied that neither he or any other person could have collected more carefully or more successfully than was done at the many different localities visited by members of the Expedition in Grinnell and Hall's Land.

Having now stated my facts, I beg to advance the opinion that the disproportion in the number of individuals in the species of *Conchifera* and *Gastropoda* must be due to the presence or absence of suitable food; thus the four species of *Conchifera* mentioned as occurring, both recent and fossil, in great numbers, subsist on diatoms, and the abundance of those forms in the Polar water gives an easy explanation for the presence of these Mollusca. A supply of suitable food is evidently not forthcoming for the support of the *Siphonostomata*; consequently the limited number of individuals in that order.

A consideration of the ocean temperatures and tidal movements of Smith Sound and northwards is, in itself, a sufficient reason why its molluscan fauna should change very materially from that now existing south in Davis Strait. Putting in the back ground the distance of 1200 miles of latitude, we find that the Davis Strait tide is met at Cape Frazer by the icy cold water of the Palæocrystic Sea escaping down Robeson Channel. In all probability this frigid stream occupies the entire bottom of Smith Sound; but its temperature becomes somewhat modified as it debouches into Baffin Bay, and is overspread by the warmer waters of the Davis Strait tide.

From whence, then, are we to consider the molluscan fauna of Smith Sound has been derived? If from Davis Strait, then we must contemplate a movement of species from the comparatively warm area indicated by a bottom temperature of 34° to 36° ,* meeting and invading a strong southerly setting glacial current of 29° , the normal temperature of the water in the Polar Ocean.

Is it not natural that, under such circumstances, a great number of Davis Strait species should have failed to enter Smith Sound? It is, on the other hand, possible that the entire molluscan fauna of Smith Sound derived its origin from the Polar Basin, and is not indebted at all to any introduction of molluscan forms from Davis Strait.

Incomplete as is our knowledge of the molluscan fauna of the

* Cruise of 'Valorous,' Proc. Roy. Soc. 1876.

regions referred to, yet I think the facts advanced do not admit of the supposition that the collections made by the recent Arctic Expedition do not fairly represent that of Smith Sound and northward—from lat. 79° to $82^{\circ} 30'$ N.

NUMBER OF RECENT MOLLUSCA OBTAINED IN DAVIS STRAIT, AND
NORTHWARDS IN THE AMERICAN ARCTIC CIRCLE.

Expeditions.	Localities.	Latitudes.	Species obt'ned.
'Valorous,' Jeffreys .	Davis Strait . . .	60° — 70° N.	122
Belcher .	{ Northumberland and Wellington Channels }	75° — 77° N.	45
Hayes .	Port Foulke . . .	78° — 79°	21
British Arctic of 1875-76 . . .	Smith Sound . . .	79° — $82^{\circ} 30'$	35

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OCCASIONAL NOTES.

BLACK RAT IN SOMERSETSHIRE.—On September 18th one of our village cats distinguished herself by capturing a fine specimen of a Black Rat, the only example of this ancient breed which has ever fallen under my observation.—M. A. MATHEW (Bishop's Lydeard).

ABSENCE OF THE WEASEL FROM IRELAND.—It is a pity that the few who believe in the existence of the Weasel in Ireland have never been able to produce an Irish specimen. Some years ago a friend of mine made it known that he would give £5 to anyone who would bring him such an animal; yet up to the present time not one has been produced.—W. KINSEY DOVER (Castle Connor, Ballina, Co. Mayo).

WILD CAT IN THE ISLE OF WIGHT.—It may be inferred from the Editor's scepticism in regard to the alleged existence of the Wild Cat in the South of England (p. 339) that he believes in its existence in the North. What dwellers in the New Forest may think of it I know not; it may not have been met with there, but of its occurrence here there can be no doubt. This Cat is not "of hearth-rug ancestry" I am confident. Countless generations could not have so transformed it; but, however that may be, here it is, and may be inspected. Having so recently described a Wild Cat from Inverness-shire ('Zoologist,' 1876, p. 4791), the minute description of another would be a work of supererogation.—HENRY HADFIELD (Ventnor, Isle of Wight).

SWIMMING POWERS OF THE MOLE.—The following facts concerning the swimming powers of the Mole were communicated to me the other day by my brother-in-law, the Rev. Geoffrey Hill. He was fishing on Loch

Morar, in Inverness, at the time, and wrote me this account:—"One day I saw a mole swim across the loch. It must have swam a mile and a half. I came across it when it had come about three-parts of the way, and, having nothing to do, as it was too still and sunny to fish, we accompanied it to the land, rowing alongside of it, as if it were Captain Webb swimming across the Channel. I don't know that this little fact is at all curious, but it may be, so I wished you to know of it." I certainly was not aware that the Mole had such powers of endurance in the water, or that it possessed such perseverance and strong instinct to make good its point over such obstacles.—ARTHUR P. MORRES (Britford Vicarage, Salisbury).

[Mr. Bell, in his 'History of British Quadrupeds' (2nd. ed. p. 130), says the Mole is "an expert swimmer," an action for which the structure both of the hands and of the hinder feet are well adapted. Other instances of its powers of progression in the water will be found narrated in the Natural History columns of 'The Field' of 24th August, 1872, and the 10th, 17th and 24th June, 1876.—ED.]

THE GREEN SANDPIPER IN STIRLINGSHIRE.—On the 26th of August last, while walking with a friend down the bank of the River Carron, our attention was suddenly attracted by a peculiar note, and almost immediately I saw two birds flying down the river about a hundred and fifty yards off. I at once said "Green Sandpipers." The conspicuous white rump being distinguishable at a great distance in a favourable light, we followed them up, and had two opportunities of seeing them at close quarters, when the extremely dark mantles and upper surfaces of the wings showed in striking contrast to the large white patch upon the back. On one occasion they flew out of a willow tree (the branches of which overhung the river, and the roots of which were submerged), and were then joined by a third. We did not disturb them further that day, but at half-past five on Monday morning we were again at the river-side. That morning we found no less than six birds, in all probability a brood, and four with their parents. They were extremely wild and quick on the wing, often on being flushed rising at once to a great height, flying round, continually uttering their low but clear notes, "Tsiu-it" or "Tsiu-it-tsui,"—notes which I do not remember having heard at their breeding-quarters in Norway, where Mr. Alston and I found them not uncommon in pairs near Skæien-i-Land in 1871. After circling round for some time they would descend almost perpendicularly, but on reaching to within a few feet of the surface of the water would suddenly open their wings and skim away for quite a hundred yards before again alighting. Thus it was sometimes difficult to mark them down if willows or alders fringing the banks intervened. After nearly two hours' unsuccessful chase, I at last succeeded in driving a single bird which had separated from the others, high over my friend's head, and he secured it by a long shot. We noticed on several occasions how extremely

quick-sighted these birds are, and how rapidly and swiftly they can alter the direction of their flight. On hiding behind the alder-bushes for the chance of a passing shot, as the birds were being driven up or down the river, they often came directly overhead, but with great rapidity shot perpendicularly upward, or suddenly diverged to the right or left, offering only a most puzzling shot. They seldom flew low over the river, but, as I have mentioned already, rose swiftly over the tops of the willows and alders on the banks before flying horizontally. The clear notes were distinctly heard when the birds were quite three hundred yards off, and yet when heard much nearer they always sounded low and almost sibylline. Former occurrences of this species in Stirlingshire are recorded in Gray's 'Birds of the West of Scotland,' when somewhat of the same habits were observed by me, but I have not at present that work beside me for reference. My impression is that these birds now frequent our river as regular early autumn migrants, arriving in August and often remaining till the middle of September. They have been frequently seen by our gamekeeper's son, and were at once recognized by him when I showed him a skin; and he tells me he has seen them about this time of year frequenting the same part of the river on several occasions in different years. There is the possibility of their having bred here, but I scarcely think they would have escaped observation so long if they had. I think we may look upon them as "early autumn migrants" frequenting a favourite locality some weeks in passing, or until circumstances of food or season require them to move further southward again. The specimen obtained is now in the collection of the gentleman who shot it, Mr. G. E. Paterson, of Glasgow. Since then all the low country along the river-side has been flooded, and this may have caused the birds to leave; but when the water subsides I shall again search for them, and if there be anything further worthy of remark will report the same.—J. A. HARVIE BROWN (Dunipace House, Stirlingshire).

MIGRATION OF THE RING OUZEL.—On September 5th I saw a fine male Ring Ouzel in the garden of a house at the entrance of Wanstead Park, some six miles from London: having a good pocket-telescope and abundant opportunity for observation, there could be no question of the identity of this well-marked species. After remaining in view for about a quarter of an hour, it flew off in a south-easterly direction till lost to sight in the distance. I trouble you with this notice rather with the hope that other contributors to 'The Zoologist' will communicate any occurrence of the bird in this neighbourhood during September, and whether solitary or in company with others. About ten years ago I saw a single cock bird near West Ham. I have noticed them towards the end of September, in flocks of about twenty, on the wild uplands in the south-west of Dorsetshire, where they are regular visitants in spring and autumn, and may come from Dartmoor, where they are said to breed. White mentions them as visiting

Selbourne in considerable numbers about Michaelmas; and it would appear that they are usually gregarious in their autumn migrations. On their appearance in Dorsetshire in the spring, they seem, as far as my own observations extend, to be more scattered. Among the Yorkshire dales I have watched them with much interest in the breeding-season, when the hill-sides echo the day through with their wild notes, and have observed the boldness with which they endeavour to repel any intruder from their nests: these are found in numbers at the base of the blocks of stone that are strewn over the moors, and on stooping down to examine the eggs I have been quite startled with the audacity with which the parent birds will fly in a direct line towards you, only diverging with a loud chatter when within a foot or so of your face. In that district they would not unfrequently be seen from the parlour windows, hunting for worms on the grass-plots much after the manner of our Blackbirds in the southern counties.—ARTHUR LISTER (Leytonstone).

HOBBY NESTING IN HAMPSHIRE (p. 298).—From a short note in Wise's 'New Forest' it seems that the breeding of the Hobby was a well-recognized fact at the time of the publication of that work, although its annual decrease was particularly noticed. That the species has become comparatively scarce cannot be questioned; but it is equally certain that it visits, if it does not breed in, the extensive woods of the New Forest almost every season, for scarcely a summer passes but one or more specimens are sent to me from that neighbourhood, and generally in June, when I conjecture they would be nesting. On the 5th of August, 1876, a game-keeper in the Forest sent a beautiful pair of these birds for me to see, which he said he had shot from the nest; but on questioning him as to whether the nest contained eggs or young (being so late in the season), he eluded the question by saying he "believed" they were nesting near, but that he had not discovered the nest. In the previous year a young bird was sent me from the same locality, and its wing-feathers were not sufficiently grown to enable any extended flight, so it must have been reared somewhere near. The same year a pair built a nest, or rather appropriated an old one, in a wood within two miles of Ringwood, but the female was shot before she laid an egg, and subsequently the male disappeared. The Hobby is said to arrive in the New Forest, where it is locally known as the "Van-winged Hawk," about the same time as the Honey Buzzard formerly did; but I fear eventually it will share the fate of the latter bird, which has ceased to visit us for several consecutive seasons; and no wonder, since the epithet of "vermin" has been bestowed upon all its race; and the exorbitant price offered by dealers, both for birds and eggs, has gradually led to its extinction.—G. B. CORBIN (Ringwood, Hants).

HOODED CROW IN NORFOLK IN AUGUST.—On the 18th of August my father saw a Hooded Crow here. On the 20th I saw it again in my

garden, and, as I was afraid of its depredations among the young Pheasants, I went after it with my gun and shot it. I found that it was a young bird, and not, as I at first suspected, an old one which had received a wound and had remained about all the summer.—J. H. GURNEY, JUN. (Northrepps Cottage, Norwich).

WHITE-TAILED EAGLE ON THE NORTH COAST OF CORNWALL.—I think I may safely record the occurrence of this Eagle on our north coast, from information I received from an accurate observer and sportsman, who saw the bird at no very great distance, wheeling about in the air, and bending its course apparently from the northern cliffs near Tahidy Park towards the south. My friend Mr. Walter Pike, of Camborne, told me of this, and that he plainly observed the full white tail, and that it was very distinguishable against the sky. The bird looked very large, and in its wheeling flight sometimes was nearer than at others, and was closely mobbed by different smaller birds. We have occasionally had this Eagle on our coasts in the immature or cinereous plumage, but I do not remember an instance of its occurrence in the adult state.—EDWARD HEARLE RODD (Penzance).

NOTES FROM SOUTH DEVON.—The following Natural History notes were jotted down by me during a prolonged stay at Watcombe Park, South Devon, and may perhaps interest some of your readers. During March I saw several Hooded Crows, and one morning at the beginning of April a beautiful specimen of the Great Gray Shrike, which perched upon a Rhododendron, but I did not see it afterwards. The Cirl Bunting was by no means rare during the colder months, associating with the Yellow Bunting and Chaffinches. It is somewhat strange that I had never met with this species alive before. On the 12th of May I had a pair of them sent me from Leominster, where they had been shot a day or two previously. I believe Mr. Gatecombe has described a variety of the Yellow Bunting of an uniform yellow colour: I saw a very similar bird in April amongst some others of the normal type; in fact it differed so much from its relatives that at first sight I almost thought it was an escaped Canary. I saw it occasionally for several days, but it eventually disappeared, and I was unable to learn anything of its destiny. I could not say positively whether it was the Cirl or Yellow Bunting, but I believe the latter. To the credit of certain vigilant persons in this part of Devon, the "Wild Birds Protection Act" is emphatically respected, if we may judge by the number of placards and notices which are posted in all directions, and the frequent discussion of the subject by the rural classes and those otherwise interested in birds. Whether this is the chief cause of the increase of certain species I am not prepared to say, but it is pleasant to be able to record the sight of several small flocks of Goldfinches; and upon inquiry I found that their increase had been noticed, especially by the promoters of

the Act, in several parts of Devon, where previously they had been getting very scarce. This I hope is the case throughout the country, for I have noticed that in Hampshire they are also gradually increasing. The "sümmer visitors" certainly arrived here no earlier than they did in Hants; in fact a comparison of dates would indicate that the bulk of them were later, although perhaps they were rather backward in their movements this season on account of the cold and winter-like spring, if indeed that at all affects their migration, which I somewhat question, for it is certain that a mild spring is not always indicative of their early arrival, any more than a cold spring retards their flight. I did not see any Swifts until May 3rd, when I observed three coming up in a direct line from Torbay, and this would be several days later than I have recorded their first appearance for the past nine years at home; in fact I generally observe them between the 14th and 23rd of April.—G. B. CORBIN (Ringwood, Hants).

SWAN-MARKS.—The Manuscript Department of the British Museum has lately acquired, for the Egerton Library, two interesting manuscripts illustrating the history of marking Swans, and a short notice of them will, we think, be not unacceptable to our readers. The first is No. 2412, a small quarto paper book of eighty-nine folios, written apparently in a hand of the seventeenth century. It commences with an alphabetical list of the owners of the marks, among whom appear the King and Queen, the Dukes of Norfolk, Suffolk, and Richmond, Earls of Huntingdon, Essex, Oxford, Sussex, Surrey, and Leicester, with a large number of noble and private owners, amounting in the aggregate to several hundred. The diagrams of the marks follow, arranged in double columns, of six marks each to a page. A large proportion of the owners have two marks, and now and then three are attributed to the same possessor. Although the collection is a compilation of the time already referred to, it evidently incorporates some older work of the same nature, for among the names of Swan-owners occur the Prior of Spalding and the Abbot of Peterborough. The volume is inscribed with the autograph of Samuel Knight, a former owner of the book. The other manuscript, Egerton 2413, is an oblong octavo in vellum, containing thirty-eight folios, with double columns, of six marks each on either side, making a total of about eight hundred marks; some of the spaces having been left unappropriated. From the commencing mark being attributed to "I. R.," which in the previous manuscript is given to "The Kinge," there is little difficulty in fixing the date of the production of the book. These two manuscripts, lately acquired, are evidently copies of an older work, and it will be useful to mention here a few notes of similar records extant in the British Museum. In Harley MS. 483, at folio 217b, is a memorandum of "A Commission directed to al maners Shireffes, Eschetours, Baillieffes, Constables, Swanneherdes, and all hauyng the Rule of freshe Ryuers and waters in Somersetshire, especially in the freshe waters or Ryuers of

Merkemore, Cotmore, etc., that the king hath geven al Swannes in the said waters late apperteynyng to the Marques Dorset and Sir Giles Dawbeney nowe in the kinges handes by reason of theire forfaictures, to my lord priue seale, geuen at Westm^r the ix day of May anno ij^{do}." The date of this early note is probably 1485. Add. MS. 4977 is entitled "a book of the marks of Swans, with the names of the gentlemen who have right to make use of them." It is an oblong octavo in vellum, with an alphabet of names prefixed, and a large series of marks. It appears to have been written in the fifteenth century, but has several additions of a later period. The two swords which are given as a king's mark in Eg. MSS. 2412, 2413, here figure as that of the Duke of Lancaster, a title which merged into the crown in 1399. Add. MS. 6301 is a fine large quarto in vellum, of twenty-eight folios, with fifteen marks on either side of the leaf. The two marks of the king are here styled—the first, "for the Crown," being a rude representation of that emblem; the second or Lancaster mark, "for the Sworde." There is an index at the end of this manuscript, and at the beginning some curious notes of Swans that "I have marked," "Swans sould this yeare of our lor 1628," and "The order for Swans," a collection of rules and observances with regard to the keeping and marking of these birds, with the penalties for infringement. The Harley MS. 3405 resembles this MS. very closely, but with occasional variations. Add. MS. 6302 is another vellum book, in octavo size, apparently of the time of Henry the Eighth; the king here has three marks allotted to his Swans. Some remarks by Sir J. Banks upon the age of the book are prefixed. Add. MS. 23732 is entitled "The orders for Swanne Bots by the Statutes and by the Auncient Orders and Customs used in the Realm of England," a vellum roll of the seventeenth century; followed by the Swan-marks used by the proprietors of lands on the rivers Yare and Waveney, co. Norfolk. Some of these are drawn vertically instead of on the more usual horizontal plan, and the greater number are rudely painted in red and black pigments. MS. Lansdowne 118 contains at folio 80 a list of "Swannes marked ye xii of June, 7^o E. 6, 1553," in the handwriting of William Cecil, Lord Burghley. Harley MS. 4116 gives, at p. 403, a curious note respecting the transfer of a Swan-mark in 1662. Some further illustrations of this peculiar custom may be seen by reference to the Clasped Catalogue of Manuscripts in the British Museum; and a careful collation of the marks, with a view to publication, would reward the student of English manners and customs.—*From 'The Athenaeum,' 18th August, 1877.*

BEWICK'S SWAN AND CANADA GOOSE NEAR SHEFFIELD.—A few weeks ago I received a Bewick's Swan which had been shot two years previously on a dam at Wadsley, near Sheffield. It was seen in that neighbourhood in March, 1875, and was supposed to have strayed from an ornamental

pond close by, which, however, was not the case. When first seen it was in the company of a number of tame ducks and geese, with which it associated during the day-time; but in the evening it took flight to Clay-wheel Dam at Wadsley Bridge, where it was shot and afterwards taken to a Natural-History dealer in Sheffield to be sold, the shooter not caring to have it mounted for himself, as it is considered unlucky in that neighbourhood to have a stuffed Swan in the house! It was purchased in the belief that it was an ordinary Mute Swan, by Mr. A. S. Hutchinson, now stuffer at this Museum, who had seen it on the dams, but when he brought it to the Museum I saw that it was an adult specimen of Bewick's Swan, *Cygnus Bewickii*, and obtained the above particulars from him and from the man who shot it. A Canada Goose, *Anser Canadensis*, was shot on the same dam at the beginning of 1875; and in June last I was informed that an uncommon bird had been shot on Clay-wheel Dam at Wadsley, and on making enquiries I found that it had been plucked and eaten by its utilitarian captor, so that I was not able to identify it, but the man who shot it immediately recognised it as the Canada Goose on looking through Morris's 'British Birds.'—E. HOWARTH (Curator, Sheffield Public Museum).

PIED FLYCATCHER IN EPPING FOREST.—I bought the bird which accompanies this note of a dealer in Seven Dials. He told me it was caught in the neighbourhood of Epping Forest on the 13th September. I kept it for three days, and had got it to feed freely on chopped egg and meal-worms, when it suddenly died. I believe it to be a Pied Flycatcher, but am not sure. Will you kindly identify it for me?—HARRY LEE (The Waldrons, Croydon).

[The bird is a female Pied Flycatcher.—ED.]

CURIOS DEATH OF A SWALLOW.—When out with the Sheffield Naturalists' Club at Kiveton Park, in June last, I found under an old oak tree a dead Swallow, *Hirundo rustica*, with wings and tail outspread. On examination, the cervical vertebræ appeared to be dislocated, and as it had evidently been suddenly killed whilst flying, it occurred to me that it had met its death by coming in contact with a branch of the tree whilst in too eager pursuit of its insect prey. As the Swallow is so keen of sight and rapid in movement, such an accident seems rather remarkable. There were no telegraph-wires near.—E. HOWARTH (Curator, Sheffield Public Museum).

PURPLE GALLINULE AT HICKLING BROAD.—In connexion with the correspondence which has been going on about the *Porphyrios* killed in this country, you will be interested in hearing that a specimen, in the most perfect plumage, was killed at Hickling Broad last week, viz., on September 7th, and has been well mounted for its owner, Mr. Micklethwaite, by Mr. T. E. Gunn, of Norwich. I have little doubt it is one of my own, which

made its escape during the summer. My bird was perfect when it got away, and the same may be said of this. As soon as I had the latter in my hand I saw that it was the green-backed species, like mine, that is to say, *Porphyrio smaragdonotus* of Africa. Hickling Broad is no great distance from Northrepps, and if it once got there it might easily maintain itself among the swamps in the neighbourhood.—J. H. GURNEY, JUN. (Northrepps Hall, Norwich).

PARTRIDGE COMING IN COLLISION WITH A TRAIN.—A few days ago a Partridge struck the engine-driver's bull's-eye of one of our Norwich engines and smashed it. The guard who produced the Partridge said that the glass was an inch thick. This was not a case of attraction by vivid light, but of simple collision.—ID.

WOOD SANDPIPER AT BARNSTAPLE.—A Wood Sandpiper, a bird of the year, was killed near Barnstaple about the middle of August. Among some Bartailed Godwits shot on the sand-flats of the Taw on September 13th was one which was already in nearly complete winter plumage. It was in company with others, which were still exhibiting some of the red livery of summer, and furnishes an example of a well-known phenomenon in the moulting of birds—that it is no uniform process, but one which varies both in time and degree in different individuals.—MURRAY A. MATHEW (Bishop's Lydeard).

THE KNOT IN SUMMER PLUMAGE ON THE EXE.—A specimen of the Knot, with the prevailing red tint peculiar to the summer plumage of the adult, was brought to me on the 11th August, having been shot on the Exe below Topsham. This is only the second specimen in summer plumage which has occurred on this river. The other was killed in May, 1844.—W. S. M. D'URBAN (Exeter).

SCARCITY OF THE CORN CRAKE.—The Rev. Murray A. Mathew calls attention (p. 387) to the recent scarcity of the Corn Crake in the West of England. He correlates the fact with increased drainage in the district, and consequent diminution of the smaller Mollusca on which the bird lives. But it is worthy of notice that in the meadows to the north-west of London, even where there has been no change in the drainage and no failure in the crop of snails, it becomes rarer every year. This spring I have not once heard its familiar cry where ten years ago—under apparently precisely similar circumstances—it seemed ubiquitous. While so many birds are profiting by the recent Acts passed for their preservation, it is curious to find a retiring species like the Corn Crake deserting its accustomed haunts.—HENRY T. WHARTON (39, St. George's Road, Kilburn).

HOBBY IN OXFORDSHIRE.—A fine male example of this bird was shot near Banbury on the 23rd July last. Its stomach contained lots of dragonflies. The Hobby's partiality for this food has often been noticed. When killed it was engaged in devouring a young Partridge which it had just

struck down. Mr. Wyatt, birdstuffer, of Banbury, has it to preserve for me.—C. MATTHEW PRIOR (Bedford).

CUCKOO CALLING IN SEPTEMBER.—On the 5th, 6th, 7th and 8th of September a Cuckoo was heard uttering its usual spring cry in this parish, to the no small consternation of some of the inhabitants; for in this retired village on the Downs anything unusual creates alarm, and this unwonted call of the Cuckoo in September is supposed to prognosticate I know not what calamities, one woman declaring that she cannot sleep at night for thinking of the troubles indicated! The fact, however (apart from its supposed omen) of a Cuckoo calling in September is sufficiently remarkable to deserve record. That it was a *bonâ fide* bird, and not a boy, I am perfectly certain, both because it was heard on the same day in widely separated parts of the parish, and because I listened to it in my own orchard, now at one end and in a few moments at the farther corner, to which no boy could have carried him in the interval, even if he could have escaped being seen. Moreover, I flatter myself that I can recognize the note of a Cuckoo, and distinguish between that and the *vox humana*, though I make no pretensions to accuracy of ear. At the same time I regret that the thick foliage intervening prevented my catching sight of the bird, as I vainly attempted to do; not, however, for my own satisfaction, for I was perfectly convinced, but for the more complete evidence to lay before others. Assuming that the call was undoubtedly that of a Cuckoo, the question arises, was it an old bird, who ought not only to have ceased his song (?) two months ago, but to have been well on his travels to the South long since? or was it a precocious bird of the year, assaying to imitate his real parent's note, to which he was not yet, by right of age, entitled? Whichever he was, he was very assiduous in calling during the four days he spent in this parish, and he called loudly and well, and with all the air of a practised performer:—ALFRED CHARLES SMITH (Yatesbury Rectory, Calne).

BLUE-THROATED WARBLER NEAR Lowestoft.—Through the kindness of R. C. Fowler, Esq., of Gunton, near Lowestoft, who allowed me to see a specimen which has recently come into his possession, I am enabled to record another instance of the occurrence in England of the Blue-throated Warbler, *Cyanecula suecica*. It was obtained in July last, by George Boon (gamekeeper to Mr. Fowler), who found it strangled in a fishing-net strewn out on Gunton Denes, which lie off the shore just to the north of Lowestoft. It is a male bird, belonging to the Scandinavian form which has the spot on the breast red. Comparing this specimen with Yarrell's description of the species, I observe that the "line of white" he mentions below the black bar of the breast is in this example very indistinctly marked, indeed it is hardly traceable; and examining it by the side of Gould's plate of the species, the principal difference to be noted is that the black bar on the

breast is much broader in the specimen before me than in the specimen figured, and is scarcely at all interspersed with any other colour. The lore is of a slaty blue colour; from the lore under the eye, and as far as the orifice of the ears, there is a tinge of chestnut intermixed with brown. The feathers, which form a chestnut band below the black bar on the breast, are nearly all tipped more or less with dirty white, and are black at the base. The flanks and under tail-coverts are dirty white, tinged with light chestnut; the under tail-coverts light chestnut.—G. PETER MOORE (Blundeston Lodge, near Lowestoft).

SAND MARTINS NESTING IN A STONE WALL.—A short time ago I wrote to you saying I had found Starlings occupying Sand Martins' holes in a quarry. Since then, in July, I was surprised to find a brood of young Sand Martins in a hole in a stone wall. I watched the old birds for some time, as I felt sure there was a nest close by, but did not know where to look for it. Soon one of them flew into a dense mass of ivy on a wall, and shortly reappeared. Pushing aside the ivy, I found the nest. This is a strange case of retaliation on the part of the Martins.—C. M. PRIOR (Bedford).

PEREGRINE FALCONS ON THE SPIRE OF SALISBURY CATHEDRAL.—I am glad to see that the Peregrines have again chosen our noble spire as their general roosting-place for the winter. There are almost always a pair that frequent it during the autumn and winter months. On one occasion I noticed four soaring around the spire at the same time, one of which perched upon the summit of the weathercock. On another occasion, when I was up at the "Eight Doors," which open out on the roof at the top of the tower from which the spire springs (some 203 feet from the ground, the spire itself being 197 feet more), a fine Falcon pitched on the fretwork some thirty or forty feet above my head, and took not the slightest notice of my presence or voice. I once picked up a Snipe's leg there, which had evidently been left by them; and the workmen, when they were restoring the spire some eleven years ago, used to see them frequently bring Pigeons and Partridges there to eat at their leisure. A pair were shot there by the workmen in 1866, which afterwards came into my possession; the hen bird, a very old one, having at one time evidently been caught in a gin, having lost one of its toes, and the bill being much broken. Most people in the city know the look of the "Great Hawks" as they are called.—ARTHUR P. MORRES (Britford Vicarage, Salisbury).

CRESTED LARK IN THE ISLE OF WIGHT.—In reply to the editorial queries (p. 343) as to when, where, and by whom this Lark was shot, and by whom identified, I am now able to state that it was killed the winter before last, in a field on the Priory Farm, St. Helens, by a man named Mark Orchard. As to the species, Mr. Careless was aware of it before I took it up, inquiring how it had been procured. That a Sky Lark with a good crest has been taken for a veritable Crested Lark I can readily

believe, seeing how unobservant most people are; but no ornithologist could mistake it: besides the Crested Lark is a somewhat smaller bird—Temminck says half an inch shorter than the Sky Lark: this tallies with my observations, as recorded in 'The Zoologist,' 1874, p. 3946. It being a common, though not numerous, species in the North of France, the wonder is that so few cross the channel. A writer quoted by Yarrell says, "I am convinced I have frequently met them in the furrows and meadows of Dublin." Yarrell, apparently, was convinced too. According to old authorities there are two species; but Temminck (and seemingly Le Vaillant) considered the *Grosse Alouette hupée* a mere variety, saying, "Ce n'est qu'une variété constante du Cochevis ordinaire." With regard to the Greater Crested Lark I can say nothing, never having met with it. The Crested Larks seen in Brittany were decidedly smaller than the Sky Lark; so is this bird.—HENRY HADFIELD (Ventnor, Isle of Wight).

TOADS IN IRELAND.—As there has been some little correspondence in 'The Zoologist' respecting the existence of Toads in this country, it may perhaps interest some of your readers to hear that when I was in Kerry, about three months ago, I discovered the Natterjack, *Bufo calamita*, at Ballycarberry, near Caherciveen, which is quite a new locality for it. I brought two specimens away, and have them now alive beside me in a large box, and they appear to be doing well upon the worms that they are fed with. The only other place where, I believe, they are known to exist is at a distance (over a mountainous road) of about twenty miles, in the same county, from Ballycarberry. They there extend from the sandhills of Inch and Rosbegh to Carrignaferry, a distance of about ten miles in length and breadth. At Ballycarberry the tract they occupy does not exceed one mile in extent, as far as I could make out from the appearance of the ground. Whether the Toad should be considered indigenous to Ireland or not, is a vexed question, as there is an old tradition that some ship brought a lot of them which were liberated in Dingle Bay.—W. KINSEY DOVER (Castle Connor, Ballina, Co. Mayo).

SUNFISH IN THE BRISTOL CHANNEL.—At the end of August and beginning of September a number of Sunfish (*Orthagoriscus mola*) were observed about the mouth of the Bristol Channel. Some were seen close in by the harbour at Ilfracombe. A gentleman fishing for bass on Bideford Bay observed a couple basking on the surface of the water, and another was reported to have been seen on the same day from another boat. These fish are called "Herring Hogs" by the trawlers.—MURRAY A. MATHEW (Bishop's Lydeard).

SHORT SUNFISH IN THE EXE.—On the 10th August last Mr. John Holman, of Topsham, was fishing, with a party of friends, in the estuary of the Exe, off Powderham, which is about three miles from the sea, when they caught in the net a small specimen of the Short Sunfish, *Orthagoriscus*

mola. It measured twenty-three inches in length, sixteen inches across the body, and thirty-two inches from the tip of the dorsal-fin to that of the anal, and was brought to me the next day for this Museum. Its colour was a beautiful silvery gray on the belly and sides, and rather darker on the back. On examining it, I found adhering to the skin, so closely as to be hardly perceptible, one specimen of a round and flat trematode worm, *Capsala Rudolphiana* (Johnston), and many specimens of a fish-louse, *Lepeophtheirus Nordmanni*, as kindly determined for me by Prof. Rolleston, of Oxford. On removing the gills I found six specimens of *Cerrops Latreillii* clinging by their sharp claws to the horny laminæ, and several masses of what I suppose to be their eggs. One female specimen was over an inch in length, and had a large male specimen attached on the under side. There was also another male, but it got separated from its partner. All these parasites were still alive, although the fish had been out of the water for many hours.—W. S. M. D'URBAN (Curator, Albert Memorial Museum, Exeter).

SHORT-FINNED TUNNY AT PENZANCE.—By the kindness of Sir J. St. Aubyn, I am able to mention that a Short-finned Tunny, *Thynnus brachypterus* (Cuvier), has been taken off St. Michael's Mount, in this Bay. Its length is nineteen inches and a half. I am inclined to think that these fish occasionally find their way to market as large mackerel, from which species it is, however, quite distinct.—THOMAS CORNISH (Penzance).

OCCURRENCE OF THE PELAMID ON THE CORNISH COAST.—During the first week in August a specimen of that rare British fish, the Pelamid, *Pelamys sarda*, was taken by Mr. John Furse, of Mevagissey, in a ground-scarp in Hannah Bay. It was seventeen inches long, and weighed two pounds.—JOHN GATCOMBE (Durnford Street, Stonehouse).

[This fish, in shape not unlike a Mackerel, is so rare, that Couch says (vol. ii., p. 103), "in two instances only has it been known to have been taken in Britain."—ED.]

BOAR-FISH IN THE ISLE OF WIGHT.—The fish, of which I send an outline of the natural size, was picked up dead, but fresh, by my brother at Sandown, Isle of Wight, on July 4th. Its colours were a pinky vermillion, deepest along the back, and underneath reflections of purple and blue. The fishermen to whom I showed it considered it to be a very curiously coloured specimen of the Dory.—A. W. ROSLING (20, Bootham, York). [It is the Boar-fish, *Capros aper*.—ED.]

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

September 5, 1877.—Prof. J. O. WESTWOOD, M.A., F.L.S., President, in the chair.

Donations to the Library were announced, and thanks voted to the donors.

Mr. F. Smith exhibited, on behalf of Mr. G. A. James Rothney, a fine collection of Hymenoptera, collected in the neighbourhood of Calcutta during the past season. The majority of the species belonged to the fossorial division; among them were several fine species of *Sphegidæ* and *Bembicidæ*. In the collection were several new species of the genus *Cerceris*, also a few new species of *Apidae*, the whole series being in the finest possible condition.

Mr. M'Lachlan exhibited drawings (with details) of the extraordinary insect from Java, described by Wesmael in 1836, under the name of *Himanopterus fuscinervis*, as pertaining to the Lepidoptera. The insect remains to this day unique in the collection of the Brussels Museum. In 1866 Dr. Hagen transferred *Himanopterus* to the Neuroptera as a subgenus of *Nemoptera*. No palpi nor legs existed in the insect when first described, but from the neuration, general form, nature of the clothing, &c., Mr. M'Lachlan is quite certain it has nothing to do with *Nemoptera*, and is truly lepidopterous, allied to the North Indian insect described and figured by E. Doubleday as *Thymara zoida*.

Prof. Westwood stated that in 1876 he had also studied the type, and made drawings and agreed as to its position near *Thymara*.

Mr. M'Lachlan also exhibited leaves of a large species of *Acer* from trees growing in the grounds of Mons. van Volxen, at Lacken, near Brussels. These trees were many of them fifty feet in height, and almost each leaf had one or more large white blotches on it, being the mines of a small sawfly described by Kaltenbach as *Phyllotoma aceris*, a species occurring in England on the wild *Acer campestre*. The insect only first appeared in M. van Volxen's grounds last year, and was now in such extraordinary profusion that the flattened discs formed by the larvæ when full fed made quite a patterning noise as they fell from the trees. Unless the insect should disappear as rapidly as it came, there is every possibility that the combined attacks of the myriads of larvæ may seriously damage the trees.

Prof. Westwood exhibited specimens of two minute hymenopterous insects from Ceylon, closely allied to *Mymar pulchellus*, a British species.

Prof. Westwood also exhibited the two sexes of *Narycius (Cyphonocephalus) smaragdulus*, sent to him by Mr. James Wood-Mason, having been taken in the Nielgherries. One of the males exhibited was of a purple colour. The insect had remained almost unique since first described by Prof. Westwood, in 1842, in his 'Arcana Entomologica' (vol. i., p. 115).

Mr. J. Wood-Mason exhibited the two sexes of *Phyllothelys Westwoodi*, one of the remarkable species of *Mantidae*, as to which he had observed and pointed out (in Proc. As. Soc. Beng., August, 1876, and in Ann. and Mag. Nat. Hist., 1876) that the females are distinguished by the presence either of a well-developed foliaceous frontal horn (as in *Phyllocrania*) or of a great vertical cephalic cone (as in *Blepharis* or *Gongylus*) from the males, wherein these processes are represented by mere rudiments; and stated that a pair of *Hestias Brunneriana*, another of the species in which this interesting and novel kind of distinction between the sexes had been observed, was in the collection of the British Museum, under the MS. name of *Oxypilus pictipes*. The latter appeared to be a species common in collections; but of the former he had hitherto seen but five specimens—three females (one a nymph) and two males—all, even the nymph, exhibiting the sexual differences referred to equally and perfectly. The specimens exhibited were, the male from Upper Tenasserim, and the female from Sibságar, in Assam.

Mr. Mason next exhibited a beautifully executed drawing of the great stridulating spider from Assam, *Mygale stridulans*, in a stridulating attitude. This sketch was by Mr. S. E. Peal, who had likewise furnished Mr. Mason with a detailed description of the habits of the creature.

Mr. Mason further announced the discovery of stridulating organs in scorpions. While recently working at the anatomy of a species allied to *S. afer*, he had met with structures which, from his familiarity with the analogous ones in other Arthropods, crustaceans as well as insects, he had at once without hesitation determined to be sound-producing apparatus—even before he had found that sounds could be produced by them artificially by rubbing the parts together or accidentally in the mere handling of alcoholic specimens. He had, however, been enabled to place the matter beyond all doubt; for while at Bombay, waiting for the steamer, he had obtained, by a happy chance from some Hindustani conjurors, two large living scorpions belonging to another species of the same type; these, when fixed face to face on a light metal table and goaded into fury, at once commenced to beat the air with their palps and simultaneously to emit sounds, which were most distinctly audible, not only to himself, but also to the bystanders, above the clatter made by the animals in their efforts to get free, and which resembled the noise produced by continuously scraping a piece of silk fabric, or, better still, a stiff tooth-brush with one's finger-nails. The species—a gigantic

one from the Upper Godaveri district—in which he had first observed stridulating organs had these organs more highly developed than in the one experimented upon at Bombay, and must stridulate far more loudly, for by artificially rubbing the parts together in a dead aleoholic specimen he could produce a sound almost as loud as, and very closely similar to, that made by briskly and continuously drawing the tip of the index-finger backwards and forwards, in a direction transverse to its coarse ridges, over the ends of the teeth of a very fine-toothed comb. The apparatus, which, as in the *Mygale*, is developed on each side of the body, was situated—the *scraper* upon the flat outer face of the basal joint of the palp-fingers; the *rasp* on the equally flat and produced inner face of the corresponding joint of the first pair of legs. On separating these appendages from one another, a slightly raised and well-defined large oval area of lighter coloration than the surrounding chitine was to be seen at the very base of the basal joint of each; these areas constituted respectively the *scraper* and the *rasp*; the former was tolerably thickly but regularly beset with stout, conical, sharp spinules curved like a tiger's canine, only more towards the points, some of which terminate in a long limp hair; the latter crowdedly studded with minute tubercles shaped like the tops of mushrooms. He had met with no stridulating organs in this position in any scorpions besides *S. Afer* and its allies; but in searching for them in other groups he had come to the conclusion that the very peculiar armature of the trenchant edges of the palp-fingers in all the *Androctonoidæ*, and in some at any rate of the *Pandinoidæ* (no *Telegonoidæ* nor *Vejovoidæ* had yet been examined), was nothing but a modification for the same purpose, for the movable finger of this pair of appendages when in the closest relation of apposition to its immovable fellow could most easily be made to grate upon it from side to side so as to produce a most distinct crepitating sound; but when separated from it ever so little appeared to be incapable of the slightest lateral movement. It was his intention on his return to India to endeavour to determine this question, as well as many others relative to the species in which the presence of sound-producing apparatus had now been demonstrated by careful observation and experiment upon living animals.

Mr. Mason finally handed to Prof. Westwood for identification the larva of some homopterous insect with what appeared to be a lepidopterous case-bearing larva attached to its last segment by a tough semi-transparent cord. The specimens were from Bangalore.

Mr. Wormald exhibited, on behalf of Mr. Pryer, a small collection of Chinese Lepidoptera.

Mr. G. C. Champion exhibited some rare beetles from Aviemore, Inverness-shire; among them was *Pachyta sex-maculata*, a Longicorn new to Britain.

Mr. J. Jenner Weir mentioned a case of parthenogenesis in *Lasiocampa quercus*, which had recently come under his notice.

The President read the following letter from Herr A. W. B. Grevelink, of the Hague, relating to the insects which attack the cocoa-nut trees in the West Indies:—

"At Barbadoes the cocoa-nut trees were all destroyed by the *Aleyrodes cocois*, which afterwards, according to Sir Robert Schomburgh, extended its ravages over Antigua, Nevis, St. Christopher's, and other islands, from which I infer that it did the same in Martinique, as that island lies in the same line with the rest. The year or years, however, in which all this happened I have never been able to make out, and all that I can gather on this point, from the 'History of Barbadoes,' is that the said trees had been planted after the hurricane of 1831, and that they had attained to maturity when the insect first showed itself, which, as regards the new plantations, cannot well have been earlier than 1837.

"Now it so happened that in March of the same year, whilst serving as Lieutenant on board H.M. Brig 'Echo,' then stationed in the West Indies, I assisted in carrying over from St. Pierre, Martinique, to Curaçao a considerable number of the nopal-plant (*Cactus coccinillifera*), peopled, of course, by the cochineal insect; and as it was not many months afterwards that, in the last-named island, the cocoa-nut trees on some of the estates began to show symptoms of being affected as if by blight, which on examination was pronounced to be caused by an insect of the *Coccidae* or *Coccus* genus, many persons there have ever since held the opinion that it was introduced at the same time with the cochineal from Martinique, which opinion was not a little strengthened when, in 1839, tidings from that island stated that all the cocoa-nut trees there had been destroyed by an insect (name not mentioned), but which, all things considered, I have not the least doubt was the same species which ruined the cocoa-nut trees at Barbadoes.

"After making a voyage to Europe, I arrived again at Curaçao in the beginning of September, 1838, where I took charge of the estate St. Joris, belonging to my family, on which were about two thousand cocoa-nut trees, the greater part of which were then already in a sickly condition, caused evidently by a microscopic insect which covered every part of the crown and extended also deep down into the heart of the tree, though outwardly the stem remained free from them. I applied every means that could tend to arrest their progress, in which I persevered during several months, but without any perceptible effect, for the fronds turned yellow and dropped to the ground as before. Trees which when I arrived were still healthy successively caught the infection, their leaves withered, and after they, as well as the fruit-stalks, had all dropped, down came also the centre of the crown, when nothing remained but the lifeless trunk, a useless encumbrance

to the soil, as the wood is fit for nothing—not even for fuel. On all the other estates they had the same story to relate, and at the end of the year 1839 not one of those noble palm trees remained alive, which, to the number of 20,000, had graced this barren island only a year before.

"As for the appearance of the insect which caused this calamity, I can only say that, like other larvæ of *Aleyrodes*, it was not even so big as the head of the smallest pin in common use, and was of nearly circular outline, but quite flat, and as thin as the finest paper. It never moved that I could see, and seemed as if glued to the leaf, on which myriads of them were huddled together.

"Having thus been an eye-witness in the case, you may judge of my astonishment when, only last year, I was informed here at the Hague by a professional entomologist of some repute, that from the communication of a friend of his who visited Curaçao many years after the above-mentioned occurrence, he felt convinced that the cocoa-nut trees in that island have been destroyed by the caterpillar of a nocturnal lepidopteron. This absurd notion I have not been able to dispel, not even by producing extracts from the colonial newspaper, because, said he, although it appears therefrom that the colonists hold the same opinion as I do, yet the question remained whether that opinion is the right one. In reply, I can only say that I never expected an entomologist to believe on mere hearsay that any butterfly will soar to a height of sixty to eighty feet above the ground to lay its eggs in trees which have so little to attract them as those of the order *Palmæ*, whose leaves, from their texture, are unfit to serve as food for the larvæ of Lepidoptera.

"Passing from this subject to that of the destruction of the cocoa-nut trees in the coast regions of Guiana, here in Holland it seems nobody ever heard of those trees suffering from insects in Surinam. I beg to refer to Mr. Russell's report on the *Aleyrodes*, as well as on the beetle, which, long before the arrival of the first-mentioned insect, about three or four years ago, used to spoil the said trees in those districts, and which report must have reached you long since, as it was read at one of the monthly meetings of the Royal Agricultural and Commercial Society in Demerara, and printed in the 'Royal Gazette' (George Town, British Guiana), of the 4th March, 1876.

"From that paper, I see, Mr. Russell says his friend Dr. Whitlock calls the beetle *Passalus tridens*, which, so far as I know, may be very correct, though, judging from the appearance of one I saw in the museum at Leyden, I should not have thought it capable of boring holes which have been compared by Mr. Russell to those made by means of an augur. Among the eight species of *Passalus* enumerated by Dr. Dalton, in his 'History of British Guiana,' I do not find this one; but, of course, that is no reason why it should not be found there, as the author himself does not pretend to

give a complete list of insects. I was lucky enough to have the opportunity of inspecting a couple of beetles, which were caught on the estate of a respected friend of mine, the Hon. A. D. van der Yon Netscher, formerly a landed proprietor in Demerara, and member of the Council there. They were trapped by one of his coolies while in the act of burrowing in the ground for the evident purpose of finding their way through a hole in the rhizome up to the top of the tree, in order, by the attacks of their larvæ, to destroy it; the whole according to the manner described by Mr. Russell, whose very interesting account is fully corroborated by Mr. Netscher's, who has very obligingly drawn it up from his own experience, at my request. The beetles are a male and female, well known in the country as belonging to the real destroyers of cocoa-nut trees, and from their very prominent features, easily recognizable as answering in every point—the male to the description of the *Scarabæus aloë*, the other, or female, to that of the *S. alveus* in Dr. Voet's 'Catalogus Systematicus Coleopterorum,' both insects being stated to belong to Surinam. Let me add that, from their hirsute aspect, they look a by no means very amiable couple."

The Secretary exhibited a Longicorn beetle which had been sent from Birkenhead by Mr. David Henderson. It had been captured on the wing in that town, having probably flown from a ship in the river.

Mr. J. W. Slater read a paper entitled "Vivarium Notes on some common Coleoptera."—R. MELDOLA, *Hon. Sec.*

NOTICES OF NEW BOOKS.

A List of British Birds. The Genera arranged according to Sundeval's Method; the Nomenclature revised by HENRY T. WHARTON, M.A., M.R.C.S., F.Z.S. Post 8vo, pp. 20. London: Van Voorst. 1877.

THE question of zoological classification would furnish study for a life-time, and the more we look into it the further we seem from a satisfactory solution. Nor is the difficulty much lessened by restricting ourselves to a particular class, *Aves*, and limiting our enquiry still further by dealing only with *British* birds. The subject of "affinities" is so intricate, and "nomenclature" has become so involved and perplexing, that he is a bold man who attempts to arrange the one and revise the other. And yet if no "system" has hitherto been proposed which has met with universal approbation on the part of ornithologists, it has not been for want of suggestions. We have before us half-a-dozen modern

Classifications of Birds, all of which are worthy of the highest consideration, and are doubtless more or less familiar to our readers, but none of which seem to have met with anything like general acceptance, either from their want of sufficient simplicity and uniformity, or in consequence of their being based too exclusively upon hidden characters. To the latter category, it may be said, belong the classification proposed by Professor Huxley in 1867, which is based on the modifications of certain of the cranial bones, and the classification of Professor Garrod, published in 1874, based mainly on the arrangement of the muscles of the thigh:

Apart from the question of "basis," no two authorities seem agreed upon the question "where to begin." Mr. Pascoe, in his recently published 'Zoological Classification,' commences his classification of birds with the Woodpeckers, *Picidæ*, or more accurately speaking with the order *Pici*. Mr. Sclater prefers to begin with the order *Passeres*, and heads his 'List of Birds in the Gardens of the Zoological Society' with the Thrushes. Professor Newton, adopting the time-honoured system of Linnæus, deals first with the order *Accipitres*, and in his edition of 'Yarrell's British Birds' commences, as Yarrell did, with the Vultures.

Mr. Wharton, in the 'List' before us, while agreeing with Mr. Sclater in giving priority to the order *Passeres*, or, as he would term it, *Oscines*, prefers the Nightingale to the Thrush, and accordingly commences with the former species. When it is stated that he begins with the Nightingale and ends with the Hooded Merganser, some idea may be formed of the changes which he advocates in the system hitherto generally adopted by British ornithologists. But in this matter, we are aware, Mr. Wharton will disclaim responsibility, since his genera are arranged, as his title-page informs us, "according to Sundevall's method." Any criticism, therefore, as regards the arrangement would have to be directed against the late Swedish Professor, and not against the author of the present 'List.'

Under these circumstances our remarks will be confined to Mr. Wharton's revision of the nomenclature, although we may note *en passant* a few of the more noticeable changes of position in the system to which some species have been subjected. The Dartford Warbler is removed from its proximity to the Whitethroat group of Warblers, to which we consider it is very closely allied, and

finds a place between the Dipper and the Wren! This is, of course, unavoidable in employing Sundevall's method, because, according to his classification, on each side of *Melizophilus*, and between *Cinclus* and *Troglodytes*, numerous genera come in which have no representatives in the British List. The result, however, must seem very unnatural to anyone not acquainted with Sundevall's work.

Again, the Bearded Titmouse is removed from its accustomed proximity to members of the genus *Parus*, and is placed, not—as might be supposed—near *Emberiza*, but between *Anthus* and *Accentor*, a position as unnatural as that assigned to *Melizophilus*. Under these circumstances, why the English name "Titmouse" should be retained we are at a loss to know, since if it is not a *Parus* it is inconsistent to call it a Titmouse. The less objectionable name "Reedling" might be substituted.

To find the Larks separated from the Buntings by such widely different genera as those which include the Crows, Creepers and Swallows, is equally surprising; and to discover the Pigeons in the same order as the Woodpeckers, from which they differ so remarkably both in structure and habits, is no less startling. But for the assignment of these and other positions to which exception might be taken, Mr. Wharton, as we have said, is not responsible. He has taken Professor Sundevall's grouping of the entire class *Aves* as he has found it, and, arranging the British species in accordance therewith, has only taken upon himself the task of revising the nomenclature.

It must not be supposed, however, that we intend for one moment to disparage the classification of Professor Sundevall, for although we do not agree in all the details, yet, based as it is upon a careful and particular examination and comparison of the external and internal characters of birds, it is in our humble opinion by far the soundest system of any yet propounded. We would merely observe that, in applying it to include only those species which are regarded as British, without at the same time showing, where necessary, the absence of families and genera which form connecting links, is to do, as it were, an injustice to a system intended to apply to the entire class *Aves*, and not to the birds of any particular country.

In dealing with the nomenclature it is evident that Mr. Wharton has been guided, and very properly so, by the Rules for Zoological

Nomenclature proposed by the British Association Committee, and, so far as we have had leisure to follow him, he would seem to have arrived at very correct results. We differ from him, however, at starting, on one or two rather material points. Speaking of the uses of the present 'List,' in his prefatory remarks, he says, "it shows at a glance what birds may rightly be considered British." In this we do not agree. Mr. Wharton defines a British bird as one which has at least once, beyond a doubt, occurred in a truly wild state within the area of the British Isles, while we cannot but think that no true estimate of the British Avifauna can be arrived at unless the rare and purely accidental visitants to this country be carefully distinguished from the resident species and such as are periodical and regular immigrants. Hence we are unable to admit that such birds as *Pycnonotus capensis*, *Agelæus phœniceus*, *Sturnella magna*, *Coccyzus americanus*, and a host of others, which have no claim to be regarded even as palæarctic species, "may rightly be considered British."

Nor can we agree with Mr. Wharton that his 'List of British Birds' shows "to a certain extent their affinities." That it does so in a large number of instances we admit, but in many others a very erroneous impression is conveyed. Take, for example, *Melizophilus undatus* and *Panurus biarmicus*, above referred to. What are their affinities according to the present List? The first-named appears to be most nearly allied to *Cinclus aquaticus* on the one side and to *Troglodytes parvulus* on the other; the second is placed between *Anthus Richardi* and *Accentor collaris*; and yet in neither case can it be said that there is the slightest degree of "affinity," in the proper acceptation of the term, with the genera to which each is contiguous. We are not amongst those who delight in the subdivision of genera, a process which, in our opinion, is now-a-days carried a great deal too far, and we cannot help thinking that Mr. Wharton's List would be more acceptable to British ornithologists had fewer subdivisions been adopted. To place eight species of River Warblers in five different genera, and to have eight different genera for as many species of Owl is a process of refining which seems to us quite unnecessary, while it tends to destroy the value of the binomial system. If every genus or subgenus is to contain but one species (as it seems likely will one day be the case), it would be simpler to give each species one name instead of two. On the other hand, if

the subdivisions adopted by Mr. Wharton be justifiable, one cannot help noting the inconsistency which marks the separation of, say, *Gecinus* from *Picus*, while the Yellow Wagtails are allowed to remain in the same genus as their Pied relatives. Why should the Serin Finch, which possesses all the essential characters of *Fringilla*, be removed from the genus in which it was placed by Linnæus and dignified with a genus of its own? Why should the Green Sandpiper be removed from its recognized proximity to *Totanus glareola*, and have a genus to itself—*Helodromas*? We are aware that in the skeletons of these two birds a difference is observable in the posterior emargination of the sternum; but this seems scarcely sufficient to warrant a generic separation of two species which, in regard to external form, structure of bill, foot, and tarsus, flight, note, habits, mode of feeding, colour of eggs, and manner of rearing their young, are obviously as closely allied as any two species can well be.

These and many other questions of a similar kind suggest themselves as we glance through the 'List.'

In regard to the inconsistencies of terminations, to which we have referred, an instance or two will best illustrate our meaning. We observe that the Redstart is named *Ruticilla phœnicurus*, Linn., presumably because Mr. Wharton was unwilling to alter the form of the specific name bestowed by Linnæus. For the same reason, apparently, we have *Erithacus rubecula*. And yet in the case of the great Reed Warbler and the common Reed Wren, Mr. Wharton has altered the termination of the specific names given by Linnæus and Vieillot from *arundinacea* and *strepera* to *arundinaceus* and *streperus*, to agree in gender with the genus *Acrocephalus*, in which he has placed them.

We notice that *Parus britannicus*, recently differentiated by Messrs. Sharpe and Dresser,* and *Motacilla cinerocapilla*, Savi, identified by Mr. Gould and Mr. Gurney as accidentally occurring in this country, are not recognized. Neither does Mr. Wharton recognise the British form of the Longtailed Titmouse, which he calls *Acredula caudata* of Linnæus, although he distinguishes our Nuthatch from the *Sitta europaea* of Linnæus, and calls it, no doubt correctly, *Sitta cæsia* of Wolf and Meyer.

We observe, also, that several species, as *Vireosylvia olivacea*, *Regulus calendula*, *Picus villosus*, *Picus pubescens*, *Ceryle alcyon*,

* See Ann. Mag. Nat. Hist., 4th Series, viii., p. 437.

Cypselus caudacutus, *Charadrius fulvus*, and many others, are omitted entirely from the List, although, according to Mr. Wharton's own definition, they ought to be "rightly considered British," since they have "at least once, beyond doubt, occurred in a truly wild state within the area of the British Isles."

In regard to the specific names adopted we have not much criticism to offer, because in most instances, as we have already remarked, the rules for zoological nomenclature have been strictly applied, and priority has been given to the oldest name to which a recognisable description has been attached. We may, however, point out one or two instances in which we consider it possible that Mr. Wharton may be mistaken. Is not the Firecrest *Regulus ignicapillus* of Jenyns, not Brehm? The first-named naturalist, in his 'Manual of British Vertebrate Animals,' p. 113, certainly writes, "*R. ignicapillus, nobis.*" Should not *Falco peregrinus*, Tunstall, be *F. peregrinus*, Gmelin?—unless Tunstall, in his 'Ornithologia Britannica,' 1771, of which we have never seen a copy, forestalled Gmelin's description of this species, which was not published until 1778.

We should like to know Mr. Wharton's reasons for identifying the Spotted Eagle, which has occurred half-a-dozen times in this country, with the *Aquila clanga* of Pallas, instead of with the smaller *Aquila nævia* of Gmelin, with which it has generally been identified by British naturalists. *Sterna macrura*, Naumanu, as Mr. Wharton has it, ought surely to be *Sterna hirundo*, Linnæus; and *Alca arra* of Pallas is an older name for Brünnich's Guillemot than *A. brunnichi* of Sabine. We may point out, too, that the American Little Stint, which has accidentally occurred in this country on two occasions, is not, as Mr. Wharton supposes, the "Semipalmated Sandpiper," *Ereunetes pusillus* (Linnæus), but the smaller species, with toes cleft to the base, upon which Wilson, in 1813, bestowed the name of *Tringa pusilla*, and which many ornithologists call *minutilla*, Vieillot, although erroneously so, for Vieillot's name was not proposed until 1819.

Did space permit we might extend our criticisms considerably; but we think enough has been said to show that, while Mr. Wharton certainly merits the gratitude of British ornithologists for the great pains which he has evidently bestowed upon the undertaking, his 'List of British Birds' is still not quite so perfect a one as we may hope some day to see published.

A List of the British Macro-Lepidoptera. Scientific and English Names with several hundred English Synonyms added by the Author, MONTAGU BROWNE. Second Edition; 8vo, pp. 28. Birmingham. 1877.

THIS, a second edition of a List printed on one side only for labelling cabinets, and extending only to the end of the *Noctuae*, is intended chiefly for the use of collectors of butterflies and large moths. In a few lines of Preface the author informs us that "the system pursued in his list is that the scientific names should follow Doubleday's arrangement, subject to a corrected spelling where the Greek or Latin root proves it to be necessary, in which case the name as it should be written appears first, followed by the name which years of error have now rendered admissible. The first English name is usually that adopted by Newman, while those which follow are merely local synonyms, useful perhaps for comparison, but not required in all cases."

From this it will be seen that Mr. Browne has set himself the task of revising the nomenclature, and of adding what he terms English "synonyms," but by which he of course means English local names. As regards the first part of the undertaking, we are sorry to say that either a large number of typographical errors have been allowed to pass uncorrected, or there has been a want of care on the part of the author, of which he is evidently not sensible. In a second edition this is the more noticeable. If *Sæsia formicæformis* be correctly altered to *S. formiciformis*, why do *S. muscæformis* and *scoliæformis* remain unchanged? *Smerinthus* and *Heliophobus* are no doubt correctly latinized in their terminations; but why are *Brephos*, *Ennomos*, *Thanatos*, &c., uncorrected? *Diphthera* surely should be *Diphthera*, and *Symyra*, *Simyra*.

We could point out other similar errors, which, although apparently trifling, become of some importance when the author, so to say, prides himself upon his skill in revision.

As regards the second part of Mr. Browne's self-imposed task, we have no doubt that many collectors whose hobby must often take them far afield will be glad to have the local names, especially of the rarer insects, with which this List supplies them.

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ON THE PREPARATION OF SKELETONS FOR MUSEUM PURPOSES.*

By PROFESSOR W. H. FLOWER, F.R.S.

EVERYONE who has a museum, however small, should be familiar with the mode of preparing skeletons. I can only indicate the outlines of the process, for in this, as in every other part of the work of making anatomical preparations, a few practical lessons from a person already an adept, and a little experience and observation, will do more than any description. When the principles are known, the details can be carried out with such modifications and improvements for each individual case as the skill and ingenuity of the operator can suggest. With regard to museum specimens generally, the question is frequently asked how such or such a preparation is made, and an answer is expected, in a few words, which will enable the questioner to do the same himself. This is much as if a novice who had never handled a brush were to ask an artist how he had painted his picture, and expect that a few simple directions would put him on a level with the master. Preparation-making is an art which can only be acquired by labour and perseverance, superadded to some natural qualifications not possessed in an equal degree by all.

To return to the bones, as in many respects the simplest kind of preparations. There is a popular notion that skeletons are made by putting animals into ant-hills. So I have been told over and over again ever since I was a child. I must, however, say that

* From a Lecture delivered at the Loan Collection of Scientific Apparatus, South Kensington.

I have never actually seen, or even heard of, a skeleton really made in this way, though ants, doubtless, especially in hot countries, will make short work of the flesh of an animal's body, leaving at least all the larger bones untouched. But we must adopt some safer and more universally applicable method of proceeding. Another common idea is that some "chemical" substance is necessary to steep them in for dissolving the soft parts, and I am often asked, "What acid do you use for this purpose?" when a little reflection would have shown that the bones would be the first parts to disappear under the influence of such a menstruum. No, water—pure water—is the only thing required in preparing bones and skeletons in the great majority of cases, and in the proper use of the water the art of "macerating," as it is called, chiefly consists.

This process is nothing more or less than placing bones in water and leaving them undisturbed until putrefaction of all the flesh and blood remaining on and around them and within the hollows and small cavities of their interior, takes place, and these soft parts entirely lose their form and structure and become converted into liquids and gases mingled with the water or escaped from its surface; so that when the bones are removed and well washed, nothing remains but the comparatively indestructible true osseous tissue, which, when dried, is hard, clean, and without smell.

Maceration consists, then, essentially in the destruction of the soft tissues by putrefaction, and certain circumstances are essential or favourable to the success of the process. In the first place, the water should not be too abundant in proportion to the amount of animal matter to be destroyed. Then it should never be changed or disturbed until the process is completed. The surface should be exposed to the air, and the loss from evaporation supplied from time to time. The temperature should be uniform and elevated. Cold checks the process; freezing arrests it altogether. If the heat is too great the bones are often greasy and discoloured, as when they are prepared by boiling. It is to the fact that the process varies in rapidity according to so many circumstances that the chief practical difficulty, which is to know when it is completed, is due. If the bones are taken out too soon, unless they are returned immediately to the same water, a check takes place in their preparation. To estimate the necessary time is a matter acquired only by practice and knowledge of the surrounding circumstances. Much will

depend upon the size of the bones, small bones macerating much more rapidly than large ones; also upon their condition. If fresh they macerate far more quickly than if they have been previously dried (as is the case with skeletons sent from abroad in a rough state), or if they have been kept in spirits or any other preservative solution.

When the bones are to be removed, the water must be carefully poured off through a hair-sieve, and all the solid matter which remains at the bottom of the jar must be carefully searched for any of the smaller bones which might otherwise be lost. They are then removed to clean water, frequently changed for several days, well washed with a brush if necessary, and dried, if possible, in the sun.

The process of maceration is necessarily attended with disagreeable smells. So long as it continues, the surface of the water slowly emits gases; but the worst is when the water is stirred up by pouring it off to remove the bones. Hence it should be carried on in the open air, or, what is far better, in a building isolated for the purpose, and in which the temperature may be kept uniform. When maceration has to be conducted among dwellings, it is necessary to be very careful not to disturb the vessels, and to put some disinfectant, as chloride of lime, into them the day before the contents are taken out. This will obviate most of the usual disagreeable effects, and if not used in too great a quantity will not cause any material damage to the bones. But chloride of lime, when used too freely, is a dangerous agent; it destroys the gelatinous portion of the osseous tissue (which of course is not removed in maceration), and leaves the bones white, chalky, and friable. After proper maceration no chemical bleaching is required. Exposure to sunlight or alternate sun and rain for some months is generally good, especially for large solid bones, though this may be carried too far, as the intensely white, cracked, porous and fragile condition of osseous fragments which have been lying long on moors or hill-sides, shows. Bones are not naturally of a pure white colour, but have a delicate yellowish or creamy tint like that of ivory.

Several substitutes for the process of maceration in water are occasionally adopted under special circumstances:—

1. Boiling. This process has the advantage of rapidity, but is seldom resorted to except when absolutely necessary (as in the

case of the celebrated skeleton of the "Irish giant" in the Hunterian Museum), as the fatty matter in the medullary cavity is melted and pervades the whole osseous tissue, and generally leaves the bones discoloured and greasy, as may be seen in most of those that have been cooked for the table.

2. Burying in the ground may be resorted to when there are no conveniences for maceration, but it is even a slower process. The effect upon the bones is the same, but they are nearly always stained brown by the colouring matter in the soil, and the small ones are apt to get lost.

3. It has occurred to me, following out a suggestion of Mr. Seymour Haden's, in his excellent letters entitled 'Earth to Earth,' relating to the best mode of disposing of the dead, to clean bones by burying them in a basket of charcoal, and though the experiments are not quite complete they promise excellent results, especially as all the disagreeable odour of maceration is entirely obviated, and the process may even be carried on in inhabited rooms without any inconvenience.



BIRDS OBSERVED BETWEEN CAPE FAREWELL AND CAPE CLEAR.

BY H. W. FEILDEN, F.G.S., C.M.Z.S., &c.

IN the month of October, 1876, I sailed from Davis Strait for Ireland on board H.M.S. 'Alert.' We met with foul winds and dirty weather coming down the middle of the Strait, and strong baffling winds in the longitude of Cape Farewell, which accompanied us most of the way across the Atlantic. The greater part of the day was passed by me on deck, and the officers when on watch, knowing my proclivities, invariably called me when any bird out of the common came in sight. I think therefore that we noted amongst us most of the individuals that came near the ship during daylight. I have purposely avoided mentioning our daily latitude and longitude, as, to many persons who may not have a chart at hand, constant repetition of figures does not aid the memory, but has rather the contrary effect,—at least I know that is my experience,—but I have given the approximate distance

from the shores of Great Britain or Ireland, or some other land, our course across the Atlantic being made between the fifty-sixth and fifty-third parallels, or in about the latitude between Edinburgh and Dublin.

October 14th, 1876, about 300 miles S.W. of Cape Farewell and midway between Greenland and Labrador; wind N. by W. Fulmars in abundance, several small land birds flying about the ship. Amongst them I recognized Redpolls and Snow Buntings. During the afternoon a Short-eared Owl, *Asio accipitrinus*, lit on the rigging; then it flew several times round the ship, alighting with outspread wings on the water under the lee of the vessel, rested for a minute, and then rose again and flew off. This Owl is possessed of great powers of flight, and a passage from Greenland to the shores of the American continent must be a matter of small moment to it.

October 16th, 1684 miles from Portsmouth. Kittiwakes numerous around the ship, also Fulmars.

October 18th, 1088 miles from Cape Clear. A few Fulmars and some seven or eight Kittiwakes about the ship. Lieutenant Egerton, when on watch, saw a single Little Auk, the only one observed by us whilst crossing the Atlantic.

October 19th, 965 miles from Cape Clear; wind S. Kittiwakes numerous, the majority in immature plumage; a single *Puffinus major* following the ship.

October 20th; blowing a full gale from S.W. During the height of the storm Fulmars, Greater Shearwaters and Kittiwakes remained by the ship.

October 21st, 716 miles from Cape Clear. At mid-day Fulmars, Greater Shearwaters and Kittiwakes in attendance.

October 23rd; distance to Cape Clear 517 miles; wind changed to S.E. A Starling lit on the rigging, rested a few minutes, and then flew away to leeward. A Sanderling passed the ship in the same direction, also several small land birds. These had all evidently been blown out of their course by the south-east gale. Storm Petrel noticed for first time since leaving the ice. At noon our latitude was $53^{\circ} 59'$, and during the day the Fulmars which had attended us from Davis Strait left. It will be a curious fact in connection with the southward range of this species in the Atlantic if it can be shown that it does not pass south of the fifty-third parallel. In 1875, when bound for Greenland, on June 6th, we

were 170 miles west of Ireland and 360 miles S.W. of St. Kilda, in lat. $53^{\circ} 51'$ N. On that day Fulmars surrounded the ship, and never left us again until we were past the north-water of Baffin Bay and embayed in the ice of Smith Sound. This observation of mine corroborates that of the late Professor Goodsir:—"Two days after we left Stromness, I noticed numbers of the Mollemoke or Fulmar Petrel, *Procellaria glacialis*, following us. When to the southward of lat. 53° they disappeared entirely; but whenever we were to the northward of that parallel, the whalers' constant companion, the 'Molly,' again made its appearance, and we were never without numbers of them to enliven us throughout the remainder of the voyage."*

October 24th, 450 miles from Cape Clear; wind S.W. A Starling alighted on the ship during the morning watch, and was captured. Greater Shearwaters, Kittiwakes, and Storm Petrels in attendance.

October 25th, 255 miles from the Skelligs. A Snipe, *Scolopax gallinago*, seen by me, also several small land birds chirping about the upper rigging.

October 26th, 129 miles from the Skelligs. A Snipe and a Sky Lark came on board and were captured. Several Greater Shearwaters about.

October 27th. The Greater Shearwaters followed our ship to within ten miles of the coast of Kerry, and then we left them. When we were off the Great Skelligs, numerous parties of Manx Shearwaters passed the ship.

My belief is that the land birds we met with so far out in the Atlantic had been carried there by strong south-easterly gales. In all probability, before crossing half the width of the Atlantic, they would be met by westerly winds, the prevailing ones in that part of the ocean, and if not too worn out might again reach European land. It is not, however, difficult to imagine how such birds might be transported to Greenland.

* 'Arctic Voyage,' R. A. Goodsir, 1850.

ON THE OCCURRENCE OF THE HOBBY IN IRELAND.

BY THE EDITOR.

WHEN the late Mr. Thompson, of Belfast, published his 'Natural History of Ireland,' now more than five and twenty years ago, he evidently had some doubt as to the propriety of including the Hobby, *Falco subbuteo*, amongst the birds of his own country, and, with that accuracy which always characterized him, and which has rendered his work even to the present day the most reliable text-book on Irish Ornithology, he contented himself with the statement that it "has once at least been obtained in Ireland."

The specimen referred to was shot, as he informs us, at Carrig-rohan, near Cork, in the summer of 1822 (?), and a coloured drawing made at the time subsequently showed that the species had been correctly identified. .

On referring to Prof. Newton's edition of Yarrell's 'British Birds,' now in course of publication, I find that only one other Irish specimen is noticed (vol. i. p. 66), namely, one in the Museum of the Royal Dublin Society, which was shot in June, 1867, in the county of Tipperary. As I am enabled to give the particulars of the capture of this specimen, and have notes on the occurrence in Ireland of three or four others, I think it may be as well to record them.

The last-mentioned bird was shot on the 6th June, 1867, while hawking for flies over the river at Moulfield, Clonmell, the seat of Mr. John Bagwell. Mr. H. B. Murray, of Heywood, Clonmell, who noticed the fact in 'The Field' of June 15th, 1867, and subsequently in 'The Field' of July 10th, 1869, remarked that the stomach of this bird contained nothing but the remains of small beetles and large flies—a circumstance fully confirmatory of what is known respecting the food and habits of this species.

Five years previously—namely, in May, 1862—a female Hobby was shot by the late Mr. Hall Dare's gamekeeper at Newtown Barry, County Wexford, and a male bird which was in company with it escaped. The pair had been observed to frequent a small fir wood in the neighbourhood, and in all probability would have nested there had they been allowed to remain undisturbed. This circumstance, which had been briefly mentioned in 'The Field' of the 20th December, 1862, was noticed in more detail by the late Edward Newman in 'The Field' of the 21st February, 1863.

Either the last-mentioned locality must be an attractive one to this species of hawk, or the keeper referred to is more than usually discriminating in his pursuit of so-called vermin, for in June, 1869, he shot another Hobby on the same property at Newtown Barry, and the owner, Mr. R. W. Hall Dare, not only forwarded a note of the occurrence, which was published in 'The Field' of July 3rd, 1869, but was good enough at the same time to send the bird for identification; so that any doubt which might have existed as to the species being correctly named by him was thereby removed.

On referring to his note, I find that allusion is made to a specimen of the Hobby in the Belfast Museum, but I learn from Mr. Douglas Ogilby that this is probably a mistake, since he has ascertained, from Mr. Darragh, the Curator of the Museum in question, that the only example of *Falco subbuteo* in the collection is a badly stuffed specimen from the South of France.

In 'The Zoologist' for 1875 (p. 4537), Mr. John Selater has recorded the capture of an adult female Hobby, which was shot by Mr. H. A. Hamilton at Balbriggan, County Dublin, on the 7th June, 1875, and was forwarded to him in the flesh. An examination of the contents of the stomach revealed the previously unsuspected fact that the Hobby sometimes preys upon bats, for two skulls with the under jaw-bones attached and some wing-bones of bats were brought to light.

For my own part, I am not much surprised at this, for the Hobby, like its congener, the Red-footed Falcon, seeks much of its prey at twilight, when moths and beetles are on the wing, and would therefore be likely at times to meet with bats. A flight at a Noctule with a Hobby would be a sight to gladden the eye of a falconer, and although this large bat flies so high, and is capable of turning very rapidly, I make no doubt that the Hobby could take it if so minded, for I have known this bird to pursue and overtake a Swallow—a much more nimble prey.

From the foregoing notes it would appear that there are at least five well-authenticated instances of the occurrence of the Hobby in Ireland, and it is not unreasonable to assume that others may have escaped observation. Greater attention being given now-a-days to Ornithology, and more exactness in the method of observing, it is not unlikely that Irish naturalists will find this bird to be a more frequent visitor in summer to Ireland than has been hitherto suspected.

THE BIRDS OF THE BERMUDAS.

BY SAVILE G. REID, LIEUT. R.E., F.Z.S.*

Ortyx virginianus, Virginian Partridge or Quail.—This bird, known to us on this side of the Atlantic as a comparatively recent introduction, under the name of Virginian "Colin," is the game-bird of Bermuda; but whether it originally found its way there from the American continent without the agency of man is doubtful. It is not mentioned by the old historians. It is certain, however, that, though common some few years previous to 1840, it became extinct in the islands from that year till 1858 or 1859, when, thanks to the enterprise of Mr. Richard Darrell, an importation took place from the United States. Several pairs were turned out, and these, increasing rapidly, soon spread over the islands to such an extent that the species may now once more be considered common. The manners and customs of this handsome bird are too well known for me to venture on details. From my notes, however, I extract the following, which may prove of interest. It is extremely prolific. Mr. Samuel Harvey told me of a nest near his garden containing eighteen eggs, every one of which hatched off; there are seldom less than twelve eggs in a nest; they sit in the cedar trees on wet days, and during the mid-day heat, roosting there at night. When once flushed they are very hard to put up a second time, even with good dogs, being able, according to popular superstition, to conceal their scent at will; they run rapidly, and squat closely in the thick sage-bush, the strong smell of which is calculated to puzzle a dog. Their call-note is triple, "hoo-woo-woot," the "hoo" indistinct and audible for a short distance only. I don't think "Bob-White," the familiar American name, fairly represents the call; it is too sharp and well-defined. These birds are fond of the ripe berries of the sage and cedar; the latter give the flesh a decidedly unpleasant aromatic flavour. They also eat the sweet potatoes in small pieces. Great numbers of the young are destroyed by the swarm of cats which infest the islands. An old "coloured" lady once accosted a gallant officer of the 53rd Regiment, who was beating some likely ground near her cottage, and asked him what he was looking for. "Partridges!" cried she, with a sneer on her sable features, "I don't want a gun to get them. Why! my cat brings me in one every

* Concluded from p. 424.

morning!" Cats, however, are not the only foes to be dreaded. The "coloured" sportsmen take the eggs and eat them, while a white "sportsman" resident on the islands was once overheard to say, "It's all very well for the officers; they get lots of practice,—can shoot Partridges at any time,—but the only time I can get them is when they have nests, and I can kill the old birds." No wonder the poor birds are kept down, and increase with lamentable slowness. If it were not that they are so hard to put up and shoot in a workmanlike manner (two brace being quite a "bag" in one day) their extermination would be a matter of a few years only.

Squatarola helvetica, Gray Plover.—Unlike the next species, this is by no means a frequent visitor to the Bermudas. One was killed, and another seen, by Major Wedderburn at Mangrove Bay in September, 1848. I shot one on the beach below the Sand-hills on the 5th, and another near Warwick Camp on the 13th November, 1874. Both these birds were alone.

Charadrius virginicus, American Golden Plover.—Dr. Coues is of opinion that the American bird cannot be specifically separated from the Asiatic *C. fulvus* (an undoubted specimen of which has been recently obtained in the Prybilov Islands). It can always be distinguished from our European *C. pluvialis* by its gray axillaries. An excellent account of the appearances of this species in Bermuda is given by Mr. Hurdis (Nat. in B., pp. 71—77), who goes carefully and thoroughly into the question of its wonderful migrations. Major Wedderburn says (p. 36), "During some years large flocks of these birds pass over the islands in the months of September and October; but, unless in stormy weather, they do not alight in any great numbers. I have seen it as early as the 21st August, 1847, at Ireland Island; again on the 25th July, 1848, at Hamilton. The latter was a single bird sitting on the road close to the house in which I lived; but by the time I got out it was gone. On the 9th March, 1852, one was shot in beautiful plumage, on the north shore; and this is the only instance of its appearing in spring." Numbers appeared in September, 1874, frequenting the grassy slopes of the north shore—their favourite haunt—and even the parade grounds, during the continuance of a three days' revolving gale. Many were shot, all in the mottled dress which procured for the species the specific name "*marmoratus*." Small flocks continued to arrive at intervals during the autumn, remaining only a few days in each case. I obtained specimens on the 14th and

23rd November in complete winter dress. The arrival of the Golden Plover in August or September is the beginning of the shooting season in Bermuda, and is eagerly looked for by the British officer, who forgets all the heat and discomfort of the summer in the pleasure of once again handling his gun and cartridges. And a nicely-cooked Golden Plover for breakfast is by no means to be despised, as those who have been trifling with tough fowls and doubtful eggs for months can well testify. The note of this species differs from that of *C. pluvialis*; it sounds like "wee-o-weet," sharply but clearly pronounced.

Ægialitis vociferus, Kildeer Plover.—The latest of the southward migrants, but regular in its visits. First seen about the middle of November, in small flocks, which remain till February, attaching themselves principally to the grassy bottoms and moist places on the south side. Persons living on this side hear their sweet wild note all night. A few remain till March, or even later.

Ægialitis semipalmatus, American Ringed Plover.—Arrives in small numbers early in August with the annual invading army of Stints and Sandpipers, remaining till October, and frequenting the sandy bays on the south shore, also the muddy edges of Peniston's Pond.

Ægialitis melodus, Piping Plover.—Rare. Major Wedderburn shot one at Mangrove Bay in September, 1848, and two were seen on a rocky island in Hamilton Harbour in September, 1850. Mr. Bartram has one specimen. Not observed in 1874.

Strepsilas interpres, Turnstone.—This cosmopolitan species is a frequent visitor. It has been shot as early as the 3rd August. I obtained two on the 23rd December, 1874, but it probably remains all the winter.

Himantopus nigricollis, Black-necked Stilt.—The American representative of our *H. melanopterus*. Only one has occurred, shot at Warwick Pond on the 3rd June, 1853, by Mr. Hinson, and sent to Mr. Hurdis.

Lobipes hyperboreus, Northern Phalarope.—One found dead, floating in Riddle's Bay, March 21st, 1848, sent to Rev. H. B. Tristram. A female, partly in ruddy plumage, killed with a stick in Hamilton Harbour on the following day, and a third example captured on the edge of Devonshire Swamp by Mr. Hurdis on the 8th March, 1852. "It is remarkable that all the specimens were obtained without the aid of a gun" (Hurdis).

Philohela minor, American Woodcock.—“A single specimen was shot near Hamilton in October, 1842, and one was supposed to have been seen at Hungry Bay a few years afterwards by Mr. Fozard” (Nat. in B., p. 42).

Gallinago Wilsonii, American Snipe.—Usually makes its first appearance at the beginning of October, a straggler or two remaining till January, and occurs also in March, April and May in limited numbers on its northward journey. It has been seen as early as the 13th September (Hurdis). It seems rather a farce to talk of the snipe-shooting in Bermuda; but occasionally large flights come in, and really fair bags are made, such as six or nine couple a-day to two guns. Pembroke Marsh is the great place for them, and a few usually take up their quarters in Devonshire Swamp. They are very good eating at first, but soon become rank from feeding in the brackish mud. They lie closer than our European Snipe, and a dog is a *sine qua non* in the thick scrub-grown marshes. Their note is very similar, but they differ somewhat in plumage, especially in having sixteen tail-feathers instead of fourteen like our bird.

Gallinago media, English Snipe.—We have Major Wedderburn’s authority for the occurrence of this bird in Bermuda. He shot two in Pembroke Marsh in December, 1847.

Macrorhamphus griseus, Red-breasted Snipe.—One “shot by Capt. Orde on the 29th September, 1847, at Harris’s Bay; another was killed by Mr. C. Fozard on the 21st August, 1848” (Nat. in B., p. 43). A third was obtained on Pearl Island on September 10th, 1874, by Capt. Kirkwood, 53rd Regiment. This specimen was preserved by Capt. Rooke, who kindly presented it to me. [Three others were shot by Lieut. Festing, of the 20th Regiment, at Peniston’s Pond, on the 17th September, 1875.—H. D.]

Micropalama himantopus, Long-legged Sandpiper.—Major Wedderburn killed two, one of which he unfortunately lost, in the beginning of August, 1848. [Lieut. Festing shot one at Peniston’s Pond early in September, 1875.—H. D.]

Ereunetes pusillus, Semipalmated Sandpiper.—A regular visitor, arriving about the 1st August, or a few days earlier, and found in small flocks in the sandy bays, and on the margins of the open brackish ponds throughout the islands. They do not remain long.

Tringa minutilla, American Stint.—Arrives about the same time, and frequents the same localities, as the preceding species.

I shot one as late as the 23rd December, probably a straggler left behind. I also obtained a solitary example on its northward flight on the 29th April, 1875.

Tringa maculata, Pectoral Sandpiper.—Not uncommon in September and October. The first I met with was feeding with a small flock of Semipalmated Sandpipers at Peniston's Pond, on August 3rd, 1874. It was tolerably abundant till towards the end of October, being usually found singly. Major Wedderburn says of this species (Nat. in B., p. 44), "On the 9th October, 1849, they appeared suddenly in thousands, particularly at St. George's, after a heavy gale of wind; the parade ground at that place was swarming with them, and I think Colonel Drummond killed some thirty or forty couple before breakfast; but, with the exception of a few stragglers, they were all gone by the following day."

Tringa Bonapartei, Schinz's Sandpiper.—This bird did not occur in the autumn of 1874, to my knowledge. It is recorded by Major Wedderburn, and is, I believe, sufficiently numerous at times, especially in the Great Sound and Castle Harbour.

Tringa maritima, Purple Sandpiper.—One was seen by Major Wedderburn at the entrance to St. George's Harbour.

Calidris arenaria, Sanderling.—Generally to be found in the autumn months, especially on the sandy beach below the sand-hills, where I obtained specimens in November, 1874. One of these I lost temporarily, and on recovering it the next day I found that not only the body, but the webs and *shafts* of the feathers, had been devoured by a swarm of voracious ants.

[*Limosa hudsonica*, Hudsonian Godwit.—A specimen of this bird in Mr. Bartram's collection was shot near the Causeway at St. George's in the autumn of 1875.—H. D.]

Totanus semipalmatus, Willet.—One was shot by Major Wedderburn on Pearl Island on July 3rd, 1848; doubtless a young bird driven by stress of weather from the breeding haunts of the species on the North American shores.

Totanus melanoleucus, Greater Yellowshank.—More or less common, arriving early in August, remaining for a month or so. Much in request among the energetic sportsmen who brave the heat and mosquitoes for the sake of a "bag" of "snippets." Its quadruple note, "thew-thew-thew-thew," is very loud and striking. Mr. Hurdis mentions one killed when on its northward migration, on the 5th June, 1852. Another was shot by

Lieut. Denison on the 27th April, 1875, and one seen at the same time, but not obtained.

Totanus flavipes, Yellowshank.—The most conspicuous and noisy of the August arrivals. It has been seen as early as the 13th July, but usually disappears towards the end of September. Considerable numbers fall victims to the gun, as they are not bad eating. If a wounded one falls into the water it is possible to shoot the whole of the flock, as they hover over their unfortunate companion. This murderous proceeding is alluded to, I think, by Wilson. The only instances of the occurrence of this species in the spring took place in 1875, when I saw one on the 26th, and obtained two at Peniston's Pond on the 29th April. These were, of course, in beautiful plumage.

Totanus solitarius, Solitary Sandpiper.—I observed one on the 19th July, 1874, but they generally come with the other species in August. They soon betake themselves to the wooded swamps, where they may be found singly or in pairs throughout the autumn. Fresh arrivals sometimes take place in the spring. Their habit of bobbing the head and body when alarmed is very comical. I always found them very tame, even when I was accompanied by a big Clumber spaniel, whose elephantine advances in no way disconcerted them.

Tringoides macularius, Spotted Sandpiper.—Flocks of young birds appear early in August, followed soon after by a limited number of adults. They frequent the same places as the other "snippets," and serve to swell the "bag" of the gunner in August and September. A few remain all the winter, and several examples have been observed in spring, presumably strangers on their way north. The "weet-weet" of this bird, as it skims over the water like our European Common Sandpiper, is very familiar to residents in the islands.

Actiturus Bartramius, Bartram's Sandpiper.—One in my collection was shot by Gibbs at Peniston's Pond on September 20th, 1874. It was a single bird, and was in company with a flock of small Sandpipers at the time. [I obtained another in a field near Peniston's Pond on the 18th September, 1875.—H. D.]

Numenius hudsonicus, Hudsonian Curlew.—Appears early in August, in limited numbers, and is so wary that very few are ever obtained.

Numenius borealis, Esquimaux Curlew.—Commoner, and easier

to approach than the preceding. Locally termed "Wood Snipe." A good number accompanied the Golden Plover on their arrival in September, 1874, and several were killed along the north shore. Both species of Curlew remain but a short time.

Ibis falcinellus (var. *Ordii*), Glossy Ibis.—An inhabitant of the Southern United States, separated from the European species by Bonaparte in 1838, but occupying still an uncertain position with regard to it. One example only has occurred in Bermuda, seen by Mr. Hurdis, but not obtained.

Ardea herodias, Great Blue Heron.—Of this fine species Major Wedderburn says (Nat. in B., p. 38), "Many of these birds arrive in autumn, and a few remain throughout the year. In 1846 the nest of this bird, containing two eggs, was found amongst the mangrove trees at Hungry Bay. The Rev. H. B. Tristram kept one of these Herons alive in his garden (at the Parsonage, in Ireland Island), which was once seen to seize a Ground Dove and swallow it entire." I made numerous enquiries, and kept a careful lookout, but was unable to ascertain whether any second instance occurred of the nest being found. Most of the examples obtained or seen during my stay were in immature plumage. A few were always to be seen singly, among the islands in the Great Sound and Castle Harbour, being very wary and hard to approach.

Ardea egretta, Great White Egret.—Two were killed at Hungry Bay in 1840; several were subsequently seen, but not obtained. A coloured youth described two of these birds to me as having been seen by him in Warwick Swamp in October, 1874, adding that he shot one, but it was too much knocked about to keep. These may have belonged to the next species, but, from the size mentioned, I fancy them to be referable here. Mr. Bartram has obtained one specimen. [One was shot in Devonshire Swamp by Capt. Hussey, of the 20th Regiment, and presented to me on the 6th October, 1875.—H. D.]

Ardea candidissima, Snowy Heron.—Two beautiful specimens, in full plumage, were shot by Major Wedderburn in April, 1850, and several were seen in September following. Thus it seems that it visits the islands both in spring and autumn at the usual periods of migration. Mr. Bartram has a pair in his collection.

Ardea cœrulea, Little Blue Heron.—Mr. Hurdis says, "Of seven specimens of this Heron which came under my observation, four were shot in April and May, and three in September and October.

It may therefore be considered both a vernal and autumnal visitor to the Bermudas. Three of the spring specimens were beautiful exemplifications of the change from the white plumage of the young to the rich vinous purple of the adult bird." Several of these examples are alluded to by Major Wedderburn in his notes. I do not think the bird visits the islands regularly. I obtained a beautiful male from Hungry Bay on the 4th May, 1875. It was in company with a white bird, perhaps an immature specimen of the same species.

Ardea virescens, Green Heron.—Also occurs on both migrations, sometimes in considerable numbers in the spring, frequenting the dense mangroves, and being uncommonly hard to obtain. Lieut. Denison and I each shot two beautiful specimens in April, 1875.

Nyctiardea grisea (var. *nævria*), Night Heron; Qua-bird.—Immature birds are not uncommon in the larger mangrove swamps in the autumn and winter, but none have yet been obtained in adult plumage. One examined by Mr. Hurdis, shot on the 9th February, had the irides bright carmine, and the long filamentous plumes of the occiput beginning to appear. These birds sit motionless among the mangroves, and when disturbed fly into the tops of the thickest trees, whence they are very hard to dislodge.

Nyctiardea violacea, Yellow-crowned Night Heron.—Unlike its congener, this Heron has occurred in the plumage of the adult. Mr. Bartram has obtained several fine specimens. I obtained two myself, but both were in the spotted garb of youth. There is a great similarity between the young of these two species, but *violacea* may always be distinguished, in any plumage, by its longer tarsus and shorter bill. Occurs pretty regularly in small numbers, usually in autumn, but occasionally in spring. One of my specimens was shot as early as the 3rd August.

Botaurus minor, American Bittern.—A regular visitor in the autumn, and occasionally in March, frequenting the sedgy patches on the edges of the mangrove swamps. Mr. Hurdis says, "The stomach of one, shot in the Pembroke Marshes, contained an eel six inches long, a mouse, a dragonfly, a grasshopper, and part of a small golden carp." [No less than thirteen were shot by one officer, whose name I hesitate to mention, in the autumn of 1875.—H. D.]

Ardetta exilis, Least Bittern.—Has occurred both in spring and autumn, but, from its frequenting the thick mangrove swamps and hiding among their tangled roots, has not very often been obtained.

Major Wedderburn procured several specimens between 1847 and 1850. I shot a female near the Sluice-gates on March 1st, 1875. [One was obtained at Basden's Pond in December, 1875.—H. D.]

Rallus virginianus, Virginian Rail.—One was shot by Mr. Hurdis on the 6th November, 1851. He remarks, "This is the only genuine *Rail* met with—a singular circumstance, when we bear in mind that *all* the Gallinules and Crake-Gallinules known to the continent of North America have been obtained in the Bermudas."

Porzana carolina, Carolina Rail; Sora Rail.—Visits Bermuda regularly, arriving early in September (one has been shot on the 24th August), and remaining till November, a few lingering on through the winter. On their vernal migration they frequently appear in considerable numbers in March and April. I have seen them as late as the 1st May. An extraordinary large flight visited the islands in October, 1849, departing in a body after a three-weeks' stay. These birds are a great nuisance to the gunner in search of Snipe and other denizens of the marshes, as they bother a dog sadly both by their numbers and their skulking habits; and they themselves are not worth powder and shot, except immediately after their arrival.

Porzana noveboracensis, Yellow Rail.—Two obtained in Pembroke Marsh by Major Wedderburn in October, 1847.

Porzana jamaicensis, Black Rail.—Observed, and also obtained, by Major Wedderburn in 1847 and 1848, and by Mr. Hurdis in 1851, always in the autumn.

Crex pratensis, Corn Crake; Land Rail.—Major Wedderburn shot the only specimen of this European bird ever obtained in Bermuda, on the 25th October, 1847, and sent a notice of its occurrence to 'The Zoologist' in 1849. At that time it was probably not known that the species is a straggler to the United States, but latterly several instances of its appearance there have been recorded, so that the fact of its being killed in Bermuda has lost much of the mystery which was originally connected with it.

Gallinula chloropus? (var. *galeata*), Florida Gallinule; Moorhen.—Resident, tolerably abundant, breeding in the flags and sedges in the deepest and most inaccessible parts of the marshes. Also migratory, visitors appearing in October. Like the "Sora," this is a sad pest to the snipe-shooter when working the thick places, unless his dog be as steady as old Time. The Latin name

of this bird given above plainly shows that "doctors disagree" about its specific identity with our familiar Moorhen. So far as I can judge, the two are inseparable, but my Bermuda specimens seem a trifle larger than the European birds.

Porphyrio martinica, Purple Gallinule.—This bird must not be confounded with the European *P. hyacinthinus*, of which it is the American representative. Several were obtained in 1849 and 1850, in the month of April. Mr. Bartram has several specimens. I am almost sure I saw one in Devonshire Swamp in February, 1875. The shy habits and nature of the haunts of this species doubtless prevent many examples being recorded in the visiting list.

Fulica americana, American Coot.—Clearly distinct from our *F. atra*. A regular visitor in autumn, but never in great numbers. It also occurs on its northward journey, for Mr. Hurdis records one killed at Somerset on the 28th May, 1847, and I watched one close to me at Basden's Pond on the 27th April, 1875.

Phoenicopterus ruber, American Flamingo.—One was seen in a mangrove swamp by Mr. Hurdis.

Cygnus americanus, Whistling Swan.—One shot in White's Marsh; the witnesses were living in 1859.

Anser hyperboreus, Snow Goose.—Major Wedderburn's notes contain the following:—"On the 19th October, 1848, Mr. Hodgson Smith shot two of these birds, in their young plumage, at Riddle's Bay; but unfortunately for the ends of science, they furnished the dinner-table instead of the cabinet." Mr. Hurdis adds, "A wing, pertaining to one of the specimens mentioned by Major Wedderburn, was fortunately saved by Mr. Smith, which removed all doubts as to the species it belonged to. In October, 1849, two 'white Geese' were observed in Mangrove Bay, and on the 10th March, 1851, four dark gray-coloured Geese were seen on the wing, near Peniston's Pond. These were doubtless *A. hyperboreus*." I may here remark that the young of the Blue Goose, *A. cærulescens*, much resembles that of *A. hyperboreus*, and that consequently the birds seen may possibly have belonged to the former species.

Branta canadensis, Canada Goose.—Included in the list given in 'The Naturalist in Bermuda,' but with no information appended. It has been occasionally seen, but rarely obtained, in the islands. It was observed on three occasions during my stay, one being seen on Peniston's Pond in the autumn of 1874, one in the Great Sound on the 10th January, 1875, by the officers of the 53rd Regiment,

as they were leaving the islands on their homeward journey, and a third near Daniel's Head by Lieuts. Denison and Hussey, R.E., early in February, 1875. A man of colour was seen by these two officers to fire at the last-named bird; but he stupidly let drive at it, with small shot too, at a hundred and twenty yards, instead of paddling much nearer to it, as he might have done. A wild Goose, weighing ten pounds when plucked, was shot in Southampton parish on the 7th January, 1875, and eaten forthwith by the fortunate gunner or his friends. This undoubtedly belonged to the present species, but cannot be definitely recorded.

Anas boschas, Mallard; Wild Duck.—A female was shot by an officer of the 56th Regiment at Warwick Pond on November 3rd, 1854. It was in company with some tame ducks, always taking wing the moment anyone approached the water (Nat. in B., p. 48). Four—a Mallard and three Ducks—were observed in the Great Sound by Lieut. Hussey, R.E., on the 23rd December, 1874.

Anas obscura, Dusky Duck; Black Duck.—Usually visits Bermuda in small numbers in the autumn, remaining till the end of January or even later. A flock of twenty frequented Harrington Sound and Peniston's Pond from Christmas, 1871, to February 15th, 1872 (J. M. Jones). Specimens were obtained by Lieut. Denison and myself in January, 1875, when there were a good many about. They are always very shy, and when disturbed frequently fly a long way out to sea.

Dafila acuta, Pintail.—Several specimens were obtained, all in immature plumage, in the winter of 1847-8. Mr. Bartram has a male in full plumage, shot by himself near St. George's. [A female Pintail was shot by Gibbs in Smith's Marsh on the 26th October, 1875.—H. D.]

Chaulelasmus streperus, Gadwall.—A female Gadwall was captured alive in December, 1849, and was in the possession of Mr. Hurdis till May, 1851, associating with some tame ducks and laying several nests of eggs, none of which, however, proved fertile (Nat. in B., p. 47).

Mareca americana, American Wigeon.—After a revolving gale in October, 1854, several of these birds were shot, and brought for examination to Mr. Hurdis, who obtained one himself in the following month (Nat. in B., p. 49). Two were shot at Devonshire Bay by Corporal Alder, R.E., in October, 1874.

Querquedula carolinensis, Green-winged Teal.—This is an

occasional visitor in autumn. One was shot at Peniston's Pond on October 10th, 1874, and a few days later I stalked another in vain at the same place. Capt. Rooke, 53rd Regiment, shot one in Devonshire Swamp in November, 1874. I am not aware of the occurrence of the European *Q. crecca*, or common Teal, in Bermuda. It occurs as a straggler in North America. [Four were shot by Lieut. Tallents, of the 20th Regiment, in the autumn of 1875.—H. D.]

Querquedula discors, Blue-winged Teal.—A frequent visitor on its way south, but rarely seen on its northward journey; most numerous in October. Nine couple were killed in Pembroke Marsh after the gale of the 22nd October, 1854, and many more at St. David's Island, where a native sportsman is said to have killed sixteen couple during the gale (Hurdis). I obtained several specimens in October and November, 1874, and saw two, one of which I knocked down, but unfortunately lost, in the mangrove swamp near the Sluice-gates, on April 30th, 1875.

Spatula clypeata, Shoveller.—“A single female specimen was shot in December, 1844, by Mr. C. B. Fozard” (Nat. in B., p. 47).

Aix sponsa, Summer Duck; Wood Duck.—“A female bird of this species was shot by Dr. Cole, 20th Regiment, on the 16th December, 1846” (Nat. in B., p. 48).

Fuligula affinis, Lesser Scaup Duck.—To make matters clear, in treating of this species, I must call in the aid of Dr. Coues, who says, in his ‘Birds of the North-West’ (p. 574):—“Authors are at variance concerning the relationship of the bird to the preceding (*F. marila*), and the question is not yet settled. For myself I am rather inclined to keep the two apart, notwithstanding their very close resemblance, and admitting the probability that intermediate examples may be found. There appears to be something different in their range, the *F. affinis* being the more southerly. Not that it does not in the breeding season reach as high latitudes as the other, but that its autumnal movement is pushed to the West Indies and Central America, where the true *F. marila* is not recorded as occurring. It is improbable that two varieties, if they be really such, should preserve this difference.” Armed with this authority, I think I may safely refer the specimens of the Scaup chronicled in ‘The Naturalist in Bermuda,’ all of which measured only 16 to 16½ inches in length, to this smaller species, *F. affinis*. The length of *F. marila* varies from 19 to 20½ inches. The

specimens alluded to are one killed by Mr. C. Abbott, 20th Regiment, on the 19th December, 1846, and two others by Major Wedderburn, at Warwick Pond, on the 8th January, 1849. [On the 25th February, 1876, I shot a female of this species at Tucker's Town, which measured sixteen inches in length.]

Fuligula collaris, Ring-necked Duck.—One was captured, and kept for a short time alive, by Mr. Hurdis, on the 13th November, 1850. He was anxious to watch the change of the plumage, but the poor bird fell a victim to a cat (Nat. in B., p. 50).

Fuligula vallisneria, Canvas-back.—Mr. Hurdis purchased a specimen of this Duck from some boys, by whom it was captured alive in a marsh near James's Cottages, on the 30th October, 1851. It was destroyed by ants soon afterwards. On the 23rd November following he observed a very fine specimen in White's Marsh.

Bucephala clangula, Goldeneye.—“A male specimen was shot on the 10th April, 1854, in Pembroke Marshes” (Nat. in B., p. 49). There were several of these Ducks about the islands in the winter of 1874-5, and I succeeded in obtaining two, both males, in immature plumage, at Peniston's Pond, on the 29th December, 1874, and 5th February following. A flock of seven frequented Shelly Bay Marsh, and were also seen by Lieut. Hussey in the Great Sound; but I am not sure that any other specimens were procured. I at first thought my birds were *B. islandica* (Barrow's Goldeneye), but if Dr. Coues be right in his opinion as to this latter species “having apparently a circum-polar distribution, and penetrating but a limited distance south in winter,” I presume they are referable to true *clangula*. But are the two really distinct? [A female duck of this species was shot by Bendall in Devonshire Swamp on the 22nd January, 1876.—H. D.]

Bucephala albeola, Buffel-headed Duck.—One was obtained in Pembroke Marsh in December, 1845, and others have been occasionally observed subsequently. [Lieut. Tallents, of the 20th Regiment, shot a male bird of this species at Peniston's Pond in November, 1875.—H. D.]

Œdemia perspicillata, Surf Scoter.—Two recorded in ‘The Naturalist in Bermuda’—one killed with a stick in Hamilton Harbour on the 8th January, 1849, and another shot in Pembroke Marsh on the 7th October, 1854. Lieut. Hussey, R.E., shot one (a female) on a small pond near the lighthouse, on the 17th November, 1874, and kindly presented it to me.

Erismatura rubida, Ruddy Duck.—A young male of this species was shot by Dr. Cole, in a marsh near Hamilton, on the 24th November, 1846.

Mergus merganser, Goosander.—Included in Major Wedderburn's list as having been seen, but not obtained.

Mergus serrator, Red-breasted Merganser.—Mr. Bartram has an undoubted specimen, obtained by him near St. George's.

Mergus cucullatus, Hooded Merganser.—A female was caught near Ireland Island by one of the crew of H.M.S. 'Scourge,' on the 10th January, 1849, and one was shot near St. George's on the 23rd December, 1850. A third example was obtained by Mr. Bartram, and is now in his collection.

Sula fiber, Booby Gannet.—Major Wedderburn records the occurrence of one of these birds, which flew into one of the barrack-rooms at Fort Catherine on October 3rd, 1847. Another, in Mr. Bartram's collection, was shot by an officer with a revolver, curiously enough, very near the same fort. [A young bird in my collection was caught on the rocks near Fort Cunningham on the 26th September, 1875, and lived a short time in confinement.—H. D.]

Pelecanus fuscus, Brown Pelican.—Two examples are recorded by Major Wedderburn, who says (Nat. in B., p. 51), "One of these birds was shot at Hungry Bay, many years ago; and another was killed near St. George's in April, 1850, which was given to me by Colonel Drummond."

Graculus dilophus, Double-crested Cormorant.—Three instances of the occurrence of this species are recorded in 'The Naturalist in Bermuda,' viz., one shot by Capt. Orde, at Pitt's Bay, on the 10th October, 1847; one by Major Wedderburn, on Grace's Island, on the 8th February, 1848; and another, mentioned by Mr. Hurdis, which frequented the islands for some little time, but was not obtained. There is a specimen in Mr. Bartram's collection, and another in that of Mr. Lane, of Hamilton. There were several of these birds about the islands in the winter of 1874-5, but they were so wary that none were obtained. One was repeatedly seen, and once fired at, in the Great Sound; one attached itself to St. George's Harbour; and a pair frequented the "Stag" Rocks, near Shelly Bay, all the winter, conspicuous to the passers-by as they sat in solemn security on their accustomed pinnacle. I tried in vain to obtain one of these, but never got a shot. One of them

flew close over my head one morning, but I had not my gun in my hand at the moment. [One was shot at Basden's Pond, by Lieut. Tallents, of the 20th Regiment, in the autumn of 1875.—H. D.]

Tachypetes aquilus, Frigate Bird; Man-of-War Bird.—Two were obtained at Ireland Island, on the 27th and 30th September, 1848, respectively, by Major Wedderburn. One was shot by Capt. Clutterbuck, of the 56th Regiment, on September 30th, 1852, and another by Capt. Tolcher, of the same Regiment, on April 2nd, 1854. Mr. Bartram has two specimens in his collection, obtained by himself.

Phaëton flavirostris, Tropic-bird.—The geographical distribution of the three known species of Tropic-bird, *P. aethereus*, *P. flavirostris*, and *P. rubricauda*, seems not yet well defined, and no doubt their extensive wanderings will render any attempt at precise limitation extremely difficult, certainly until we are in possession of a larger series of observations than at present. *P. flavirostris* (the "Boatswain-bird" or "Long-tail" of the Bermudas) is a familiar and abundant summer visitor to the islands, arriving at the end of February or beginning of March, and departing early in October. It is also recorded on the southern shores of Cuba, but I cannot make out any other regular locality for it. Where it goes to in winter is not, I believe, satisfactorily determined, though it may be taken for granted that the movement is in a southerly direction from Bermuda and Cuba. An occasional straggler is said to have been seen in Bermudian waters in winter time, presumably an early arrival, or backward young bird left behind. One was shot as far north as the coast of Nova Scotia, after a violent gale from the south, on the 4th September, 1870. I saw this bird in the Halifax Museum. The excellent accounts of the habits and nidification of this species given by Mr. Hurdis and Major Wedderburn have left me but little to say. The single egg, which in colouring is not unlike that of our Kestrel, is deposited in holes in the rocks, always in those which have a flooring of sand, preference being given to steep and overhanging cliffs on the south shore and the islands about Castle Harbour. A few pairs nest on the northern shore, where the cliffs are much lower. Sometimes one can see the sitting bird's long tail-feathers protruding from the nest; while in another case the nest may be so far in, horizontally, that one can only tell there is one by the harsh grating cry of the disturbed occupant. Both male and female sit, fighting

vigorously with their formidable bills in defence of their home. The young also show fight; in fact, the species is peculiarly fierce and untameable. Three young ones I kept alive for about two months maintained their savage nature till the last, refusing to feed themselves, striking viciously at anyone who approached them, and even at one another. Their flight is peculiar, but graceful, and they never seem tired of their perpetual wheeling and manouvring. They take beautiful headers, like a Tern or Gannet, in pursuit of small fish. It is rare to meet with a specimen possessing two good long central tail-feathers; one is generally smaller and shorter than the other. Some of these feathers are of a lovely orange-pink. They get rubbed off during incubation, and may be picked up near the breeding-places. Two broods are reared, fresh eggs being found as early as the 10th April, and again at the end of June: there are intermediate examples, probably laid by birds whose first nests have been visited by the spoiler. That these birds revisit their breeding-stations year after year is, I think, clearly shown by the following circumstance:—Mr. Bartram, by way of experiment, slit the two webs of one foot, and cut off one or two claws, of a young bird in a nest near his house. Next year this bird turned up again, and made its nest close to the same spot. This attachment to the family residence is, I fancy, far from unusual with migratory birds. Swallows and other familiar visitors to England are known to possess it in a marked degree. On a calm day the bright greenish blue tint of the Atlantic waters, as they gently rise and fall above the white sands below, is reflected on the glossy white breasts and under parts of the Tropic-birds in a most remarkable manner as they cruise about, at no great height, along the shores or among the islands. During the breeding season the parent birds “off duty” are to be seen in the neighbourhood of their nesting-places all the morning till about noon, when the greater part disappear in a rather mysterious manner. I came to the conclusion that they proceed to a considerable distance out to sea, returning at dusk, and this opinion was much strengthened by seeing two old birds sitting on the water one afternoon, at least one hundred miles from the Bermuda shores. This was during a voyage from Bermuda to New York, on the 7th August, 1874, when the second “young hopeful” had probably left, or was about to leave, the nest, and therefore does not prove much; but it shows that these strong-winged birds, who would

probably do their one hundred miles in three hours, or even less, do travel to such distances from land long before they have thought of quitting their breeding haunts. In Castle Harbour, where there are a great number of Tropic-birds continually on the wing, and where they are left comparatively undisturbed during the day-time, this disappearance is, or appears to be, on a somewhat smaller scale.

Larus marinus, Great Black-backed Gull.—Mr. Hurdis mentions an immature example of this Gull, which was captured alive in the Great Sound in December, 1851, and Mr. Bartram has a fine specimen, also in immature plumage, shot by himself near Stocks Point on the 27th December, 1862.

Larus argentatus, Herring Gull.—Without venturing to discuss the relative merits and demerits of the varieties, or sub-species, *occidentalis* of Audubon, and *Smithsonianus* of Dr. Coues, I shall assume that all the examples that have occurred in Bermuda may be assigned to the true *argentatus*. These Gulls occur frequently, not regularly, and many specimens have been obtained. One in my collection was shot in Devonshire Bay on the 4th November, and they have been seen as late as the 19th March. [This Gull was numerous in the autumn of 1875. I obtained several specimens, all immature, the bill in most cases measuring one inch and three-quarters in length. These are probably referable to the variety *occidentalis*.—H. D.]

Larus delawarensis (*L. zonorhynchus* of Audubon), Ring-billed Gull.—Only one on record, killed by Major Wedderburn near the Dockyard on the 1st January, 1849, during a north-westerly gale.

Larus tridactylus, Kittiwake.—Not uncommon, but irregular in its visits, which occur from January to March. Most of the examples obtained are in immature plumage.

Larus atricilla, Laughing Gull.—One seen, flying close past him, by Major Wedderburn, at Ireland Island. Mr. Hurdis records that one was taken alive by a fisherman in the winter of 1851-52, and was confined for some time in a spare room, eventually effecting its escape.

Larus philadelphia, Bonaparte's Gull.—Three are recorded by Major Wedderburn. One was shot by himself on the 27th January, 1849; a second was seen by him on the 15th December, 1849; and another was killed on the 24th February, 1850. [Two in

Mr. Bartram's possession were shot in St. George's Harbour in January, 1876.—H. D.]

Xema Sabinei, Sabine's Gull.—Major Wedderburn says, "A single specimen was shot by Colonel Drummond, near St. George's, but the date I do not recollect."

Sterna anglica, Gull-billed Tern.—One only has occurred, taken alive in the R.E. workshops at Boaz Island, on the 29th April, 1875. This bird, which proved to be a female, lived only a short time. It is now in Lieut. Denison's collection.

Sterna hirundo, Common Tern; *Sterna paradisaea*, Roseate Tern.—These two Terns used to visit Bermuda annually, breeding there in considerable numbers on the rocks and small islands in Castle Harbour; but I hear they have now left the place, never to return. Doubtless the increase in the population of the island and the continual plundering of their nests have driven them away. They were sufficiently numerous in 1850; but I cannot ascertain the date of their last appearance. Not a single one was to be seen in 1874 or 1875.

Sterna fuliginosa, Sooty Tern.—Of rare occurrence. Major Wedderburn says, "Dr. Cole shot a specimen of this Tern in October, 1846. During the whole time I was quartered in Bermuda I only saw one of these birds, and that in the year 1848. I was walking on the sand-hills, and saw a bird apparently dead on the ground. I put down my gun, and picked the bird up, and was just putting him carefully in paper, when my prize thought fit to come to life and flew away, taking me so much by surprise that I never thought of using my gun. It was a most beautiful specimen, and must have been driven on shore by some heavy gale." Mr. Hurdis records that a third example was found in an exhausted state in Devonshire parish, on the 23rd October, 1854, after a severe gale the previous day. [A young male of this species, in curious plumage, was caught near Paget Quarry, and brought to me on the 19th September, 1875.—H. D.]

Anous stolidus, Noddy Tern.—A solitary example was killed near Ireland Island by Capt. Tolcher, 56th Regiment, on the 12th September, 1854.

Oceanites oceanica, Wilson's Petrel.—Major Wedderburn says, "I have often seen these birds flying about near the North Rock, and once or twice inside the outer reefs in stormy weather, but never succeeded in shooting any of them." One was shot by

Mr. Harford, 56th Regiment, some distance from the shore, on the 30th June, 1853. Mr. Bartram's collection contains a specimen. I am not aware that this species has ever been found breeding in Bermuda. I searched in vain for nests, but should not be surprised to hear of them being discovered there some day or other.

Puffinus major, Wandering Shearwater.—Two recorded by Mr. Hurdis were taken alive on the 2nd June, 1851, near Hamilton. Mr. Bartram has one example in the dark plumage, which, though probably only a special state of *P. major*, has led to the creation of the species *P. fuliginosus*, or Sooty Shearwater.

Puffinus anglorum, Manx Shearwater.—A specimen in Mr. Bartram's collection, captured while sitting on its solitary egg in a rocky hole on the south shore some years ago, is, I think, clearly referable here. The egg was unfortunately broken. There is no record of the bird's breeding on any other occasion, nor of any other specimens being obtained; but it is quite possible that it, as well as Wilson's Petrel and other *Procellariidae*, may formerly have frequented the islands in numbers, and that an occasional pair may revisit their old haunts. Such birds would, from their crepuscular habits, be but little noticed.

Puffinus obscurus, Dusky Shearwater.—Since Mr. Hurdis, in 1849, identified the "Cahow" or "Cowhow" of the historians of Bermuda with this interesting species, very few observations have been made on the few pairs still frequenting the islands. That the poor "Cahow" has almost ceased to breed there is a melancholy fact. Formerly it was plentiful, and even within the last fifteen years, Mr. Bartram informs me, there were many nests in the isolated rocks, both on the north and south shores. On the north side the bird was formerly called "Pemblyco" or "Pimlico," probably from its call-note, while on the southern shores the name "Cahow" or "Cowhow" was applied to it. I found two nests in 1874, each containing a single young bird, one of which I kept alive for about six weeks, intending to send him to the Zoological Society's Gardens in London; but before I got an opportunity of doing so the unfortunate bird died. He had become remarkably tame, following me about the house and garden, waddling along awkwardly enough on his tarsi, and uttering a musical "chirrup" the while. He used to sit under the table where I was writing, pecking away at my boots, and apparently extremely happy. I fed him on fish, and gave him

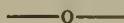
a salt-water tub occasionally, which he thoroughly enjoyed. He slept a great deal during the day, and usually got behind an open door—the darkest place he could find—for his "siesta." When I took him from the nest he was nearly able to fly, but still retained the long nestling-down of the young bird, slate-coloured on the head and shoulders, light brown on the under parts; the former soon rubbed off, but the latter was more permanent, and was not got rid of for some days. The nests were simple holes in the face of the rock—my bird had barely room to turn round in his. There was no unpleasant smell about the nests or young birds, the peculiar—and to me not disagreeable—odour of the Shearwater tribe being alone distinguishable by its presence. I saw nothing of the old birds, who were in all probability far out at sea at the time. An egg of this species, kindly presented to me by Mr. Bartram, is, of course, pure white: it has a considerable polish, and is about the size of a bantam's, but less elongated in form. Mr. Bartram was good enough also to present me with two skins of the adult bird. He tells me that the statement made by the old historians of Bermuda as to the capture of the "Cahow" at night is no exaggeration; for, on visiting an island one night where there were several pairs breeding, he quickly caught half-a-dozen of them, the stupid things settling on his body as he lay on the ground, and allowing themselves to be taken in his hand! I know of only one instance of a "Cahow" being seen on the wing in the daytime in Bermudian waters: this was in August, 1874, when one was shot crossing Castle Harbour, by Lieut. Hopegood, 97th Regiment.

Podiceps cornutus, Horned Grebe.—One shot by Dr. Cole, on the 24th November, 1846, is now in the Rev. H. B. Tristram's collection. One was killed by Capt. Tolcher, 56th Regiment, near Spanish Point, on the 1st February, 1855: it was in company with three or four others. Mr. Bartram has two specimens of different dates.

Podilymbus podiceps, Pied-billed Grebe; Water Witch.—Three are recorded in 'The Naturalist in Bermuda'—two obtained in October, 1849, and one by Major Wedderburn, in February, 1850. Mr. Hurdis once found a perfect skeleton of this bird by the side of a pond. Tolerably abundant in the winter of 1874-5, especially at Trott's and Basden's Ponds. The way in which these birds can sink under water, without leaving a ripple behind, is truly

marvellous, and entitles them fully to the name "Water Witch." They are very shy, but I once surprised one asleep on a flat stone, as much to my astonishment as to the bird's. All the specimens I saw were in immature plumage, wanting the black bar on the bill and the black throat-patch.

Mergulus alle, Little Auk; Sea Dove.—Mr. Hurdis says, "One of these birds was captured alive on the 28th January, 1850, by a servant of the Rev. J. U. Campbell at Ireland Island. It was in company with four or five others on a piece of grass-land near that gentleman's house. Unfortunately this specimen was destroyed by a pig before I had an opportunity of seeing it. My information was obtained from Mr. Campbell himself, who had this bird in his possession."



ORNITHOLOGICAL NOTES FROM DEVON AND CORNWALL.

By JOHN GATCOMBE.

VISITING Wembury again on June 12th I found the young Gulls much grown, and observed many of the old ones searching for food in a ploughed field adjoining the cliffs. Among the various marine animals with which the young Gulls are fed, I think small cuttle-fish must form a portion, as I have remarked the so-called back bones, or internal shells, of those creatures lying near the nests. The Peregrines I am sorry to say appear to have entirely left the locality. On the 13th Cuckoos were very plentiful on the borders of Dartmoor, and I noticed a young one, perched on an old wall, being fed by a Pied Wagtail. A Turtle Dove has just been brought to a Stonehouse bird-stuffer; and I mention this as the species is rarely met with in the neighbourhood of Plymouth. Some years ago the Collared Turtle, *Turtur risorius*, was occasionally killed by our gamekeepers, apparently in a wild state, and sent to be preserved for the British species; indeed, it was said to breed in some of our large woods and plantations; but I have neither seen nor heard of the capture of a specimen since. Some of our bird-stuffers, too, believed that these birds were natives, and seemed astonished on being told the contrary. But of course all the specimens must, in the first place, have escaped from confinement.

When visiting the banks of the River Lyd, on June 18th, I was pleased to see several young Water Ouzels making short flights

from rock to rock by the side of the stream: they were in the nestling plumage, their white under parts showing a yellowish tint closely marked with faint semicircular lines. Young Green Woodpeckers were also numerous in the adjoining woods; and a beautiful young male, fully fledged, was caught by a friend of mine when fishing, as it was struggling in the river, having, I suppose, fallen from some tree or bush, or perhaps failed in an attempt to fly across the stream. Both the Great and Lesser Spotted Woodpeckers have bred in the woods by the side of the Tamar this season. Swifts were exceedingly plentiful, and I observed some feeding their young in the holes of an old pillar or high stone wall, intended for a kind of railway viaduct. Sand Martins, too, again occupied holes in the banks of the Tamar, the only breeding locality for them that I am aware of anywhere within many miles of Plymouth. Strange to say about a dozen Swifts were lately captured by taking the artificial flies of fishermen on the River Dart, an incident which has been immortalised by Bewick in one of his vignettes. A fine Shag which I examined was in perfect breeding plumage, with the exception of the curved crest, which is usually lost by the middle of June; but I have seen old birds with a fine, glossy, greenish black and bronzed plumage in the middle of winter.

In my last notes I mentioned having visited a small herony near St. Germain. I have since been informed by a clergyman living in the locality, that with the aid of a long ladder he once endeavoured to look into one of the nests, but the instant his face appeared on a level with the edge a young bird made a sudden and vicious thrust straight at his eye, in evading which he nearly fell headlong from the tree.

On July 4th Blackcaps and Garden Warblers were still singing in the woods by the side of the Tamar, whilst large families of Blue and Cole Tits were already flitting from tree to tree, swinging and hanging from the branches in every conceivable posture, the parents assiduously attending to the wants of their young.

The young Gulls at Wembury were by this time for the most part fledged, though some were still in the down. A large colony of Martins were nesting on the face of the cliffs, and it was very curious to see them when flying past make a dash at the small feathers or particles of down which came from the Gulls, as if they were insects. A Herring Gull has for many years been in the

habit of visiting a certain garden or lawn at Ivybridge every morning at a particular hour, when it is regularly fed from the house ; after which it invariably takes its departure, and is not seen again until the next day ; but in the breeding season it sometimes remains away for weeks together, and has once or twice returned with a companion or mate. I have had an invitation to call in order to see this bird : I hope to learn more of its history.

In August numbers of young Herons were to be seen on the mud-banks of our rivers and estuaries, and a few at the trout streams. Young Gulls, too, were very numerous in our harbours ; but I am sorry to add scores were wantonly shot. Many Gannets, also, were to be seen off the Cornish coast, some in adult plumage, others with the head, neck and lower parts white, but the wings very dark. There was lately an account given in one of the local papers of a Gannet having been choked in its attempt to swallow a garfish. Ravens are still rather plentiful on some parts of the coast ; and a short time since three fine young birds, apparently as large as their parents, were killed at one shot when flying off the cliffs, and sent to Plymouth to be preserved. A pair of Peregrines nested in the same locality, but were killed by a farmer ; and their young, which were taken, are now in captivity.

In 'The Zoologist' for August last (p. 343), there were notes on the occurrence of the White Spoonbill in Suffolk, and near Ely. I may here mention that on May 31st I examined two Spoonbills, which had been sent to a local bird-stuffer from Cornwall, where they had been shot a few days before. Their plumage was white, with the exception of the tips of the primaries and some of their shafts being either dusky or brown ; none black, and there was no appearance of either crest or buff feathers on the breast.

I have just seen two Snow Buntings, which were brought home by a sailor from the late Arctic Expedition, and kept alive until within the last week, when they both died in moult.



OCCASIONAL NOTES.

NOTES FROM ALDEBURGH, SUFFOLK.—This has been a good autumn for waders, for there has been no lack of water in the meres. On the 14th August I had a Greenshank and a Wood Sandpiper brought to me. I have noticed several of the latter about and heard their well-known note, and

I believe the month of August never passes without some visiting their favourite haunts in the first mere. Several Black-tailed Godwits have been seen and four killed, two of which, both immature birds, were brought to me, one on the 24th August and the other on the 1st September. I had a good opportunity of watching a small party of four in the first mere early one morning. I have never met with these birds before, and have only seen one specimen in the flesh, which I recorded in 'The Zoologist' for 1871. On the 6th September I killed an adult Red-necked Grebe in the River Iken, and on the evening of the same day I had a young Shoveller Duck, two Turnstones, and a curious light-coloured variety of the Sand Martin brought in by one of the gunners. A Temminck's Stint and two beautiful Sanderlings were killed at Thorpe on the 8th September, all of which I obtained. I met with a flock of Curlew Sandpipers in the North Mere on the 10th, and shot two, both young birds. On the 26th I received an immature male Ruff, a Little Stint, and a Temminck's Stint from Aldeburgh.—JULIAN G. TUCK (Tostock House, near Bury St. Edmunds).

WADERS NEAR ALDERSHOT.—The large piece of water known as "Fleet Pond," near Aldershot Camp, through which the South-Western Railway runs, between Farnborough and Fleet Stations, has recently been almost emptied for the purpose of destroying the weeds. These had grown to such an extent that the fishing was virtually at an end. The pen-stock was opened on the 17th August, and has been closed about three weeks or so. As we have had little or no rain up to the present date (12th October) there is still very little water in the pond, and a large expanse of mud and sand continues to offer unusual attractions to various Waders and Ducks. Besides Curlews, Green Sandpipers, Dunlins, Gulls, a stray Tern or two, Snipe, and a considerable accession of Ducks, Herons and Lapwings, we have had several more noteworthy visitors. On the 23rd August I observed three Greenshanks and shot one for identification; on the 27th September there were two Ruffs, of which I shot one (this is, I think, somewhat late for this species to remain with us); and on the 6th inst. I obtained a Gray Plover, which had been badly wounded by an officer there. I previously saw two of them together, both on the ground and on the wing, but could not be sure of their identity: this is a rare bird so far inland. The Herons, of which as many as twenty sometimes assemble in the shallow water, are doing considerable damage to the fish, and are having a rare time of it. So also are the Carrion Crows,—which feed greedily on the large freshwater mussels left exposed by the receding waters,—the Snipe, and the Ducks. Of the latter family I have only seen one stranger, which I think was a Tufted Duck; most of them are common Wild Ducks from Dogmersfield Park and Hawley Pond.—SAVILE G. REID.

YOUNG THRUSH FEEDING A CUCKOO.—About two years ago, when staying at Bassenthwaite, near Keswick, where I had gone for a couple

of months in search of those rare and interesting fossils of the Skiddaw Slate, the son of the person with whom I was staying informed me that two days previously he had discovered a Cuckoo, just hatched, in a Meadow Pipit's nest along with three young pipits. As I was very desirous to procure a Cuckoo, in order to observe its habits, I had it taken from the nest, when about eight days old, and placed in a large cage, where I also put a nest of Blackbirds of the same age. The latter in a few days got too quickly advanced, in proportion to the Cuckoo, for my purpose, and I therefore replaced them with a brood of Thrushes about a week younger. These in a day or two I reduced to two in number, finding that the parent, as I wished, had discovered them. I then left but one, and about ten days later I was surprised at seeing it pick up a piece of hard-boiled egg and feed the Cuckoo with it as it sat upon a perch, on which it had to hop for the purpose. The feeding was observed by others besides myself and continued for some days until the Thrush unfortunately escaped, and about a week afterwards the Cuckoo died. Was this action on the part of the young Thrush prompted by natural instinct, or was it mere imitation of its parent? I am inclined to believe the latter.—W. KINSEY DOVER (Castle Connor, Ballina, Co. Mayo).

SCARCITY OF THE CORN CRAKE.—It may interest the Rev. Murray A. Mathew to hear that I found the Corn Crake very plentiful in the island of Tiree, on the west coast of Scotland, while on a short visit there in May last. Their "crake, crake" was to be heard in every direction on this island, fourteen miles by three in extent. The keeper told me they had been very numerous last year. I also heard them several times in the neighbourhood of Greenock at the end of the month. My brother, while shooting near Penrith, Cumberland, came across a good many. Perhaps the bird is changing its habitat and gradually moving northward. It would be interesting to hear whether this has been noticed by others in the "North Country." I can quite corroborate Mr. H. T. Wharton as to the disappearance of the bird from the north-west district of Middlesex. It used to be very common in the grass-fields about Hampstead and Hendon, but the last time I heard it was on the 19th April, 1875.—HARRY R. LEACH (Oak Hill Park, Hampstead).

BAILLON'S CRAKE NEAR PENZANCE.—On the 12th October Mr. Vingoe showed me a bird of the year of this species, which was shot on some marshy ground near the Marazion Station of the West Cornwall Railway, very near the spot where some years since the Yellowshank Sandpiper was shot. This is the third example of this small Gallinule that has been obtained in this neighbourhood. I may add it was shot by the eldest son of the Rev. D. Harrison, the Rector of the parish adjoining. In the two first specimens the adult character of the birds is shown by the pervading tint of ash-blue on the chin, breast and belly. In the present specimen

there is nothing of this colour, but a general tone of ashy brown with striated lines of brown. One of the first two specimens referred to was brought alive to Mr. Vingoe, and he had a good opportunity of observing the colour of the iris, which was a bright vermillion. This, I believe, is the colour in the adult bird. In the specimen I examined yesterday the colour of the iris was bright yellow. The weight of this little bird was just over one ounce, and the length, with extended neck, to the end of the tail-feathers, exactly seven inches and a half.—EDWARD HEARLE RODD (Penzance).

SKUA AND SHEARWATER AT CHRISTCHURCH AND POOLE HARBOUR.—When at Bournemouth in August I saw, in the shop of Mr. Hart, the birdstuffer, a good specimen of the Common Skua, which he informed me had been obtained on the 6th January, 1876. A boy had observed it in a ploughed field at Christchurch, and knocked it down with a stick. It is an adult bird and in good plumage. Mr. Hart also showed me a specimen of the Greater, or Cinereous, Shearwater, which had been captured by some fishermen in Poole Harbour on the 7th June last, apparently a female bird, and also in good plumage.—MARCUS S. C. RICKARDS (37, Cornwallis Crescent, Clifton).

EARLY ARRIVAL OF WILD GEESE.—Brent Geese and White-fronted Geese appeared on the North Devon coast as early as the beginning of October. In the first week of that month four White-fronted Geese, all splendid birds, were shot out of a flock on Braunton Marsh.—MURRAY A. MATHEW (Bishop's Lydeard).

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

October 3, 1877.—Prof. WESTWOOD, M.A., F.L.S., President, in the chair.

Donations to the Library were announced, and thanks voted to the donors.

Mr. W. L. Distant exhibited a specimen of the ravages of *Dermestes vulpinus* (Fab.) in a cargo of dried hides from China. On the arrival of the hides in this country they were found to be infested and gnawed into holes by swarms of the insect in their different stages, causing a damage of from fifteen to twenty per cent. on the value of the cargo. It is not unusual to see this well-known insect amongst these articles, but quite unprecedented to find it in such numbers and causing such an amount of damage. In fact, its appearance had quite paralyzed the importation of the hides, and gave further proof of the value of Economic Entomology in the arts and manufactures.

Mr. M'Lachlan exhibited a portion of a wooden case containing hides from Shanghai, which was riddled with borings of the larvæ of this beetle.

Prof. Westwood remarked that some years ago the attention of the Society was drawn to the depredations of this beetle in a cargo of cork.

Prof. Westwood exhibited drawings of the pupa of a trichopterous insect (*Anabolia nervosa*), which swam about in water like a *Notonecta*, but used its middle legs as swimming apparatus. Prof. Westwood also made remarks upon the structure and situation of the mouth organs of the pupæ of Trichoptera, and stated that the mandibles of the pupæ were unlike those of the larva, while these organs were quite aborted in the imago. The Professor suggested that the mandibles of the pupa were for the purpose of enabling the insect to eat its way out of the case in which it had undergone its transformation, and in which, after cementing down the mouth, it was obliged to turn itself completely round, so as to escape at the opposite free extremity.

Mr. M'Lachlan confirmed this view of the function of the mandibles of the pupæ.

The President next exhibited a small lepidopterous insect from Lake Nyassa, apparently a species of *Psyche*, which had been sent in a paper packet with a pupa-case of a *Tachina*, from which it was stated that the moth had been produced. Prof. Westwood was inclined to believe that the larva of the moth might have simply made use of the empty pupa-case to undergo its transformation in.

Prof. Westwood read a post-card from Mr. Albert Müller announcing the formation of an entomological station at Basle.

The President then referred to the lepidopterous larva attached to a specimen of the homopterous *Eurybrachys spinosa*, which had been handed over to him by Mr. Wood-Mason at the last meeting, and exhibited drawings of both insects, the former being evidently identical with the species formerly described as being parasitic upon *Fulgora candelaria* (Trans. Ent. Soc. 1876, p. 519). In the absence of direct observation, the President was inclined to believe that the relation of the lepidopterous larva to the Homopteron was one of true parasitism, the former insect feeding on the waxy secretion of the latter, it being well known that certain lepidopterous larvæ of the genus *Galleria* feed upon wax.

Mr. Wood-Mason stated that the interesting specimen which he had handed to Prof. Westwood at the last meeting consisted of a lepidopterous larva clinging by its anal pair of prolegs to the free extremity of a stout, tough, flaccid cord, which was firmly fastened to the dorsal surface of the abdomen of the Homopteron. The specimens were captured in August or September, 1876, at Bangalore, South India, by Mr. G. Nevill. The caterpillar was closely allied to *Epipyrops* (West.). The cord to which it was clinging, Mr. Mason considered to be the wet and matted remains of a

case or sac, from the imperfectly closed aboral or free end of which the caterpillar had suddenly withdrawn itself (the case-bearers, as well known, readily being able to turn in their cases) on immersion in alcohol, and on which its anal pair of prolegs had closed in their death-grasp. The end of the cord fastened firmly to the back of the Homopteron being the oral or attached end of that case; *i.e.*, the end by which the case-bearers fasten themselves when at rest to the twigs and branches of the plants on which they live, the attachment being quite as firm, or even firmer, than that of the present specimens. Mr. Wood-Mason's view of the nature of the relation of the caterpillar to the Homopteron in all these cases had always been that the former is the messmate of the latter rather than its parasite, merely making use of it as a vehicle whereon to reach its vegetable food, just as in the curious case recently brought to notice by Fritz Müller ('Nature,' vol. xv., p. 264), and employing—as Colonel Godwin-Austen's valuable note on the specimen found by him on *Aphana*, sp., and his own examination of that specimen in its cocoon seemed conclusively to prove—some of its messmate's wax to cover its body (and in some instances for the construction of a case), in order probably to render itself less conspicuous to its enemies (*Ichneumonidæ*, *Tachinidæ*, &c.) than it would be as a naked, fleshy, yellowish grub upon the white wax-covered surface of its messmate's body. He had opened the flattened squarish cocoon constructed by Col. Austen's specimen, and found the body of the enclosed caterpillar still clothed thickly on its upper surface with the satiny asbestos-like waxy substance secreted by its messmate. This specimen was probably identical with Professor Westwood's *Epipyrops*, while the one from Bangalore represented a different but closely-allied form, distinguished in the larval condition by the presence of a well-developed case, which may or may not have been rendered less conspicuous by a covering of wax borrowed from its homopterous "chum."

With reference to the firmness of the attachment of the cord to the back of the Homopteron, Mr. Jenner Weir reminded the Society that the larvæ of *Psyche* were always most firmly fixed, and Mr. M'Lachlan stated that the larvæ of *Phryganea* glued down their cases with great firmness under water.

Mr. W. L. Distant raised the question as to whether the Homopteron frequented the plants on which the caterpillar fed or whether the latter was omnivorous.

Prof. Westwood also mentioned a small dingy moth from Brazil, of which numbers had been found upon the Three-fingered Sloth, *Bradypus tridactylus*.

Mr. Meldola exhibited a collection of Lepidoptera, from Ceylon and the Nicobar Islands, formed by him in 1875. Among them were a few species new to science. The collection had recently been worked out by Mr. F. Moore.

Mr. H. Goss exhibited a series of specimens of *Lycæna (Cupido) Arion*, taken in the Cotswolds in June, 1877. One-third of the specimens exhibited were far below the average size, the remainder being of the normal size. Both forms were taken flying together at the same time of the year and in the same locality. Mr. Goss stated that according to his experience these dwarf specimens did not occur in the same proportion in other parts of the country where the species was taken. The specimens he had obtained in Devonshire and Northamptonshire were, as a rule, of the average size.

The Secretary stated that the Longicorn beetle exhibited at the last meeting, which had been sent from Birkenhead by Mr. David Henderson, had been identified by Mr. C. O. Waterhouse as *Monohammus titillatus* (Fab.), a species inhabiting the United States.

Papers read.

"On *Notiothauma Reedi*, a remarkable new Genus and Species of Neuroptera from Chili, pertaining to the Family *Panorpidae*," by R. M'Lachlan, F.R.S., &c.

"On the Lepidoptera of the Family *Lithosiidæ* in the Collection of the British Museum," by Arthur G. Butler, F.L.S., F.Z.S., &c.—R. MELDOLA, *Hon. Sec.*

NOTICES OF NEW BOOKS.

Notes on Fish and Fishing. By J. J. MANLEY, M.A. Post 8vo, pp. 363, with Illustrations. London: Sampson Low & Co. 1877.

IF we except Shakespeare and his works, on no subject probably have more books been written than on Fish and Fishing. A complete catalogue of such works would fill a volume, and one would imagine that it must be extremely difficult, even to the most enthusiastic angler, with all his *quasi* discoveries, to say anything new on such a well-worn theme. Scientific ichthyologists have furnished us with the classification and natural history of the finny tribes; ardent fishermen have detailed their most successful modes of capture; enthusiastic lovers of nature have discoursed pleasantly of their rambles by lake and stream; and learned bibliographers have dived into all kinds of curious literature and brought to light many a quaint remark long buried in the literature of angling. The author of the book before us has not confined himself to any particular line of this sort. He

has fished much, and read more, making notes by the way, and the little volume which he now offers to his brother anglers and the public he describes as a selection of "notes" from his commonplace book on angling, and from the enormous mass of piscine and piscatorial memoranda and extracts which have gradually accumulated round him. These "notes" are, therefore, of a somewhat miscellaneous order, and if they do not always contain anything very new, they are presented to us not unfrequently in a new dress, and with comments by the author which deserve perusal. Indeed the chief merit of the book before us, in our opinion, lies in the comparisons which the author draws between his own experience and that of others who have written on the subject before him. He quotes older authors on various knotty points, narrates the result of his own experience, and endeavours to reconcile or account for the curious discrepancies which are occasionally to be met with in the published statements of enthusiastic fishermen.

His first note, headed "Ichthyology," deals with the classification of fish, and their structure; and various speculations are made as to whether fish hear, sleep, and feel pain. On these points, however, the author does not speak very positively, apparently not having made any original experiments in the matter, but contents himself for the most part with quoting the opposite opinions of others.

In his second note, "On the Literature of Fishing," which occupies between thirty and forty pages, a brief account is given of some of the most notable books on angling, the subject being divided under the heads of, "Authors before Izaak Walton," "Walton's Contemporaries," "Authors after Walton to end of 18th century," and "Authors from 1800 to the present time."

The merits of "Fishing as a Sport" may be taken to be so universally recognized and admitted at the present day that our author's third "note," under this heading, might have remained unpublished without at all detracting from the value of his book; but Mr. Manley, like many another enthusiast when riding his hobby, cannot resist a desire to indite a defence of his favourite field sport against every attack, real or imaginary, that can be made against it.

The same may almost be said of the note on "Fishing as a Fine Art," upon which so much has at various times been written. But

the progress of angling as an art has really been no greater than might have been expected, considering that amongst field sports it is the least expensive to indulge in, and consequently attracts the largest number of disciples. The more a subject is studied the more is art in connection with it likely to be developed.

Space will not permit us to notice in detail the dozen or more chapters which are devoted to as many different species of British fresh-water fish. Suffice it to say that Mr. Manley seems to have made personal acquaintance with them all, and at times to have been very successful in luring them to his creel. His notes on each, although somewhat discursive, are pleasantly written, and his illustrations of fish, in the style of those in Major's edition of Walton, although not so good, add much to the attractiveness of a very readable volume.

Sketches of Animal Life and Habits. By ANDREW WILSON, Ph.D.,
Lecturer on Zoology and Comparative Anatomy in the Medical
School, Edinburgh. Post 8vo, pp. 208, with Illustrations.
London and Edinburgh: W. & R. Chambers. 1877.

WE gather from the author's Preface that this series of Sketches has been compiled with the view of affording general readers, and especially the young, some popular and yet trustworthy ideas regarding some of the most interesting groups of the animal world. The work may, in fact, be regarded as a Natural History textbook, adapted for use in Nature's school at large, and as a guide to the use of the observant powers, through the due exercise of which all true ideas of Nature are acquired.

To give the reader a notion of the varied contents of the book we cannot do better than quote the headings of the different chapters, which are as follow:—"A peep at Animalcules;" "Life in the Depths;" "Concerning Sea-Anemones;" "Sea Eggs;" "A Gossip about Crabs;" "Shells and their Inmates;" "Butterflies of the Sea;" "Cuttle-fish Lore;" "Odd Fishes and their Common-place Neighbours;" "Curiosities of Insect Life;" "Curious Animal Companionships;" "Animal Disguises and Transformations;" "Animal Armouries;" and "Footprints on the Sands of Time."

Many of these chapters are extremely interesting. They are well illustrated, and, above all, possess the great merit of conveying accurate information, which is more than can be said of many so-called "popular" books. We should like to notice some of the chapters in detail, but the limited space at our disposal prevents us from doing more than cordially recommending the volume to the notice of naturalists.

Kindness to Animals: illustrated by Stories and Anecdotes: a Book for Home and School Reading. Post 8vo, pp. 211. London and Edinburgh: W. & R. Chambers. 1877.

ALTHOUGH we have reason to believe that at the present day there is not so much reckless indifference to the sufferings of animals as formerly existed, there are nevertheless many persons who have little thought or regard for the pain which they cause or permit animals to endure. Horses are overworked and driven when lame ; sheep and cattle are overdriven and left without water ; dogs are neglected and left to wander without food about the streets ; cats are shut up in houses or turned out of doors when families leave town for the autumn. These and many other cruelties are perpetrated, not always wantonly, or even intentionally, but for want of the exercise of a little thoughtful humanity.

Thanks to the efforts of the Royal Society for the Prevention of Cruelty to Animals, the law now takes cognizance of all wilful acts of cruelty which are brought to its notice, and offenders are duly punished whenever they are convicted.

But prevention is better than cure, and it is desirable to impress upon the young the duties incumbent upon them towards animals. Gentle treatment is usually rewarded by a return of affection ; at the very least there is a satisfaction in seeing that the creatures dependent on us are happy. Even wild animals may be tamed, and will show their affection when treated with a kindly attention to their wants.

To impress these truths upon the young is the object of the book before us ; and the stories and anecdotes which the writer has collected aptly illustrate the views which we have briefly expressed.

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THE SWANNERY AT ABBOTSBURY.

BY THE REV. ALFRED CHARLES SMITH, M.A.

HAVING searched in vain through the pages of 'The Zoologist,' and other kindred journals of Natural History, for some account of this interesting colony,* I have thought it might be acceptable to ornithologists who have never had an opportunity of seeing it if I jotted down a few memoranda of a delightful day which I spent there on the 19th July last. For, in truth, being almost, if not quite unique in this country,—at all events being unrivalled in size,—the Swannery at Abbotsbury deserves the attention of naturalists, and of all who delight in a beautiful and novel sight. Moreover, the locality is one of remarkable interest in several other respects; and the archaeologist, the ecclesiologist, and the geologist, as well as the ordinary tourist would, each in his special line, find himself well rewarded by a visit to it.

Let me begin, then, by saying something of Abbotsbury. It lies, at the distance of some eight miles, nearly due west of Weymouth; and a wild, hilly, but picturesque drive through lanes abounding in a great variety of botanical species, affords excellent views of the famous "Chesil Bank," which may be seen stretching

* Some observations on this Swannery will be found in 'The Zoologist' for 1865 (p. 9671). A typographical error, however, occurs in the foot-note on that page, where the compositor has put "two hundred" for "five hundred" Swans, an error easily accounted for, but one which should be corrected. For other sources of information the reader may be referred to Hutchins, 'History and Antiquities of the County of Dorset,' 1774 (which contains a Catalogue of Dorsetshire Birds by Dr. Pulteney), Mr. Mansell Pleydell's 'Ornithology and Conchology of the County of Dorset' (pp. 3 and 41), and an accurate and interesting article in 'Good Words' for March 1st, 1867, entitled "A Visit to the Swannery."—ED.

in its entire length (eleven miles) from Portland on the east to Abbotsbury on the west. This bird's-eye view of that very remarkable natural breakwater will alone well repay the tourist; for, looking down from the high ground which the road traverses, he will appreciate—as perhaps he will do from no less central spot—the immense size of that curious bar of shingle, averaging some one hundred and eighty yards in width, and some thirty or more in height, and separating the sea from the narrow estuary called the “Fleet.” It is the “Chesil Bank” which forms the snug and very retired resting-place of the Swans by day, and it is the “Fleet,” to which it gives rise, which is—except during the breeding season—their permanent home.

Arrived at the little village of Abbotsbury, which lies nestled in a valley, secluded from the sea, from which it is but one mile distant, the tourist cannot fail to have his eye attracted to the very picturesque ruins which abound on all sides. Ruined arches, ruined gateways, fragments of wall, and other detached masses of masonry, scattered around in the meadows, indicate where monastic buildings once stood. But conspicuous above all stands the grand old Barn, of enormous proportions,—the largest and most magnificent I have ever seen,—the size of which may perhaps be imagined when I mention that I counted, on the eastern side alone, no less than twenty-two massive stone buttresses, while the imposing doorways, the well-finished gables, and the niches for statues mark how complete in all its details, and how finished throughout, was this noble barn of ecclesiastical aspect.

There are, of course, plenty of legends and traditions in connection with the Abbey and the good fathers who once inhabited it; legends, too, of the ancient Chapel of St. Catherine, the ruins of which still crown the height which overhangs the Abbey, and to which we climbed for the bird's-eye view promised therefrom. Indeed the occasional peeps we enjoyed, during momentary intervals of sunshine, revealed most extensive views seawards, another aspect of the Chesil Bank from its western extremity, and a capital sight of the Fleet, dedicated to the Swans. During the greater part of our visit to St. Catherine's Chapel thick and heavy mists continued to sweep over and envelop us; and these, however refreshing on a hot day in July, obliterated the view completely. Nevertheless we had seen enough to impress us with respectful feelings towards the interesting old Abbey and the

holy fathers who inhabited it; so that when we descended to the main object of our visit, the domain of the Swans, we had a profound sense of the power and wealth of the lordly Abbot, quondam owner of the Swannery, or the "game of Swans," as it was technically termed; who moreover enjoyed the special privilege granted by the Crown, but very seldom granted to any subject, of seizing within a certain district all white Swans not marked with a recognized and licensed swan-mark cut in the upper mandible and registered by the royal swanherd. This, moreover, was at a period when Swans were generally considered royal property, and permission to own them at all was only given under special circumstances. So it seemed to fit in with all the surrounding circumstances to learn that the seven hundred or eight hundred Swans, which now compose the colony, are only the miserable remnant, in these degenerate days, of the thousands (some say eight thousand) which abounded here in former times.

Leaving the village behind us, and approaching the sea, we found the precincts of the Swannery shut out from profane view by a high fence, at the door of which stood the custodian of the Swans, in all respects the very *beau ideal* of what a swanherd should be—a fine specimen of the class of keeper, not indeed of the modern fine gentleman type, but of the race such as Bewick's vignettes depict—workman-like in appearance, dress and manner, one who knew his business and did it. He had been in the service of the family of Lord Ilchester, the present owner of the Swannery, above fifty years; and, as regards Swans, there is little doubt that this honest old man had more practical knowledge of their habits, their life-history, and their dispositions, than all the ornithologists and members of our learned Societies put together.

It was disappointing to be told on arriving that we were *too late* for the Swans, and that to see them in perfection we should have visited them in March instead of July! I suppose the dismay which this announcement caused must have shown itself in our faces, for the worthy keeper immediately reassured us, by saying that though the bulk of the colony had gone down the Fleet, or Back-water, with their young, still he could probably show us some two or three hundred. This was quite satisfactory, indeed beyond our most sanguine expectations; for had not our chief authority on

birds, the accurate Yarrell, recorded the figure eighty as the number we were led to expect?* So it was with a light heart we bade our conductor lead on. Pursuing a winding grassy path, which led through some reed and osier beds, and traversing an extensive secluded morass, in part high and dry, and in part slushy, our guide pointed out the now-vacated nests, which were scattered thickly enough over the surface; indeed almost every available spot seemed occupied with one. These nests were composed of straw and flags, about a barrowful to each nest, and as these are washed away by the winter tides, loads of straw are supplied in March, and shot down in heaps, from which the Swans, regularly returning to the same nesting-places every year, appropriate to themselves what they require, and arrange it to their own satisfaction. There had been over three hundred nests, he told us, last spring.

Then we came to the margin of the water, and in that part of the Fleet just opposite I counted over fifty Swans, while some few were basking in the sun and preening their feathers on the Chesil Bank on the other side, and many more might be discerned in the far distance, sailing or at rest in the Fleet towards the east. They would all come back, the keeper said, in the early morning, to drink at the freshwater stream which here falls into the Fleet; but they would not come to shore to revisit their nesting-places till next March. Indeed the old birds, he assured us, come but very little to shore at this season of the year. Occasionally a very few will land on the Chesil Bank for awhile; and sometimes others will take wing and make short flights around; but the main body lives, swims and rests upon the Fleet.

Asked whether they could stand very rough weather, the keeper said that the old birds took no harm, however intense the cold or rough the wind; but that the young birds were unable to endure much inclemency of weather. At such times the cygnets nestle under the wings of their parents, who thus protect them with the best shelter they can afford, but notwithstanding all their care the young Swans are often killed by severe storms and cutting winds and intense cold. The climate of the coast of Dorset would never indeed be very rigorous; but it is notorious that the Mute Swan is much less hardy than the Hooper, and while its congener braves the severity of northern winters, *Cygnus olor* retreats to the

* Yarrell's 'British Birds,' vol. iii., p. 215 (3rd edition).

south before really hard weather sets in. I own I was very much surprised to hear that every spring this colony of the Mute Swan is invariably joined by some members of the Hooper, for Selby distinctly says they refuse to associate with one another.* This year only two Hoopers appeared, but they were remarkably fine birds. Possibly the exceptional mildness of last winter may account for the paucity of numbers, for usually the visitants come in very much stronger force. They do not, however, stay long, but within a few weeks of their arrival take their departure, and are seen no more till the following season. That the Mute Swan and the Hooper are distinct species there is no need for me to affirm here; for, not to mention the well-known difference in the colouring of their respective beaks, the difference in note,† but, above all, the difference in anatomical structure, more particularly as regards the trachea or windpipe, are sufficiently distinguishing characteristics.

Asked whether Lord Ilchester ever used them for the table, our informant said that about two hundred young birds were then in course of fattening. The process pursued is to take the cygnets from the nest just before they would naturally leave it; to place them in fresh-water ponds of small size, surrounded with high wattled hurdles, the ponds being so small that they have no room to take flight; to associate twenty cygnets in such a pond with one old Swan as a nurse; and to feed them with barley and barley-meal till they are ready for the table. To my enquiries whether the keeper did not often have violent altercations with the old birds while engaged in thus kidnapping the young, he said that the parents, and especially the old males, would show great fight and make desperate attempts to defend their young. They would come at him, he said, with wings and beak; but he never troubled about the beak; all he aimed at was to seize them by the wings and hold them tight, for they would otherwise strike very hard. The old popular notion that the stroke of a Swan's wing will break a man's arm is a delusion and a manifest exaggeration; but although long ago pointed out as such by Colonel Montagu, in the Supplement to his 'Ornithological Dictionary,' like most other popular sayings, it has continued to flourish to this day.

* 'Illustrations of British Ornithology,' vol. ii., p. 283.

† "Hooper," or "Whooper," from the note resembling the sound of the word "Hoop." See Yarrell's 'British Birds,' vol. iii., p. 192 (3rd edition).

What the flavour of a cygnet may be I cannot say, having never tried it; but if it has the slightest resemblance to that of the adult Hooper,—which I was once rash enough to taste, after I had divested it of its skin, on the coast of Norfolk,—I should say it was anything but the *Kung's-mat*, or “King's food,” as the Swedish peasants are wont to describe it. It is, however, to be remembered that as the Swan subsists almost entirely on aquatic plants,—and never, as some people imagine, on fish,—the flesh has not the slightest oily taste, so that it may be palatable to some, for “*de gustibus non est disputandum.*” Coarse, however, in flavour, and black in colour, as my experience leads me to describe it, I cannot conceive that any amount of fattening, or any culinary skill, could make it worth the four guineas generally supposed to be its cost, according to the following scale:—

For the lean Swan	One Guinea.
Fatting the Swan	One Guinea.
Dressing the Swan	One Guinea.
Cook's customary fee	One Guinea.*

It must at the same time be confessed that it was of old considered a “lordly dish,” and figures as a very highly esteemed item in bills of fare of the sixteenth century; indeed no great feast was considered complete without it.

Before we left the Swannery, our guide showed us, within the same precincts, a decoy for Ducks hard by. There were the tame Ducks, which would come to his whistle, swimming about in the Fleet outside; there were the wattled fences which screened him from view of the incoming wild Ducks; there were the openings at which he showed himself when he would drive the birds up, now well within the channel; there was the point where the dog was sent in to decoy them on; and there was the gradually decreasing channel up which they were driven till they reached the fatal bag-net at the end; all in exact conformity with Yarrell's well-known illustration. But few Ducks are caught here now; they are mostly reserved for shooting. Asked as to the average number of Ducks thus caught in the winter, he said ten or twelve at a time was a very good catch, and two hundred in the course of the winter a very fair tale of Ducks. From which I concluded that although the Swannery is undoubtedly the largest in the

* ‘The Zoologist’ for 1846, p. 1250.

Kingdom, the decoy for Ducks must, I should think, be amongst the smallest, for what would a Norfolk or Lincoln decoyman say to these insignificant results?

To revert to the Swans. Though their number is said to be sadly diminished, a flock of seven hundred of these noble birds is still a goodly colony. Indeed I know not where else in England such a sight may be seen. Lloyd, in his 'Scandinavian Adventures' (vol. ii., p. 431), speaking of the Hooper, says that astounding numbers sometimes pass the winter off the western coast of Sweden, and that Mr. Richard Dann once counted, in Kongsbacka fjord alone, upwards of five hundred birds. He adds that at the breeding season, when the ice disappears, it is the habit of the Hoopers to separate in pairs, and retire to the more sequestered of the mountain lakes and morasses.* The same graphic writer also gives a very spirited account of the annual battue of the Mute Swan, which takes place in Sweden when the birds are in moult, and therefore unable to take wing and escape; and he calls attention to the magnificent sight of a thousand or twelve hundred Swans congregated in one spot, when these Swan hunts take place, and declares that though at an English battue we may "justly pride ourselves on a *bouquet* or rush of Pheasants, yet beautiful a sight as it is to see a hundred or two of these splendid birds on the wing at once, the Swans collected at a Swan hunt carry away the palm." It is this magnificent sight, on a somewhat smaller scale, and without the butchery and bloodshed, which may be enjoyed by the visitor to Abbotsbury. He need not journey to Sweden, or to Northern Asia, Eastern Russia, Siberia, or the Caspian Sea, where the true home of the Mute Swan seems to lay; but in a retired peaceful estuary on the southern coast of England, and within an easy drive of one of our favourite watering-places, he may see a Swannery of no mean dimensions, which can scarcely fail to interest the least observant.

* For an accurate account of the breeding of *Cygnus musicus* and *C. Bewickii*, see Messrs. Seeböhm and Harvie Brown on the "Birds of the Lower Petchora," 'Ibis' for 1876 (3rd series, vol. vi., pp. 437—441).

SPRING MIGRATION OF BIRDS ON THE EAST COAST.

BY JOHN CORDEAUX.

Mr. Gätke, writing from Heligoland, February 8th, says, "Sky Larks for about five days commenced going eastward, and so did a few Blackbirds. If open weather continues the Pied Wagtail and Stonechat will be the harbingers of the approaching spring." With us in North-East Lincolnshire Blackbirds and Thrushes were in full song by the 14th of February, and building. The first Stonechat appeared on the 24th; * wind S.W. and strong. Up to the 25th the weather was remarkably fine and open—showers and warm sunny days like April. On the 26th there was a very sudden change to frost and snow. On the night of the 27th the thermometer registered 15° of frost.

Pied Wagtails did not arrive in any numbers previous to the 22nd March, coming in small companies, quickly moving forward, and others taking their place. By this date all appeared to have assumed the black chin and throat. On the 23rd there were enormous flocks of Golden Plovers, Fieldfares, and some Hooded Crows in the Humber marshes, evidently congregating for a general move northward. On the same day I was pleased to see a pair of the common Pochard, *Fuligula ferina* (Linn.), on a sheet of artificial water in this neighbourhood—a place, from its being closely preserved, admirably adapted for a nesting haunt. On the 26th I saw as many as a dozen Hooded Crows together feeding on fish-offal close to the town of Grimsby; a few, however, lingered about the marshes a month later, till the 26th April, on which day I surprised three on the carcase of a dead sheep, so gorged that they could barely rise from their putrid feast.

On the 27th March we found the first nest of the Long-eared Owl, with five eggs. The Owls had utilized an old Magpie's nest in a larch; the dome was removed and the platform covered with straw. Last season, when occupied by the Magpies, it had been lined, as is invariably the case, with very fine roots.

* I have strong reasons for supposing that the particular line of migration of the Stonechat is one across the usual routes of birds moving north and south, and that in the early spring months those of this species arriving on our eastern seaboard come from the continent of Europe, almost directly east and west across the North Sea. See a paper, "On the Migration of the Stonechat," in the 'Transactions of the Norfolk and Norwich Naturalists' Society' for 1877, p. 264.

Although Blackbirds and Thrushes had commenced building on Valentine's Day, we found no eggs before quite the end of March. On the 30th a Blackbird's nest in the garden contained two eggs; on the same day a Mistletoe Thrush's, two eggs; and on April 1st a Thrush's, three eggs—pale blue without spots.

The larch this year was unusually forward, being in flower on April 1st. The first Willow Wren was seen on the 2nd; the song was not heard before the 7th. On the 2nd also a Wheatear was seen—a fine old male in full plumage. Young Rooks were calling in the nest on the 3rd, and a Robin's nest contained two eggs; the eggs also of the Long-eared Owl were hatched off.

On April 12th, the average time of arrival,—wind N., very dry and cold,—two Swallows appeared; also the first Tree Pipit was seen, but its song was not heard before the 24th, twelve days later. My impression is that the males of this species, also the male Willow Wrens, precede the females by some days; we do not hear their notes, however, before their mates arrive. On the 14th I saw a second pair of Swallows, but—so cold and inclement was the weather—only a single bird between this and the end of the month. At the time the Swallows arrived there were hundreds of Fieldfares still lingering about the coast hedges.

On the 17th April, during a very heavy easterly gale, I saw the first Redstart, and for the next three or four weeks a remarkable number of these birds appeared to pass through the district—in every case females or the young of the preceding year; not a single old male did I see throughout the season. On the 19th the Yellow Wagtail was numerous, and I saw a single and exceedingly beautiful example of the *Motacilla alba* of Linnæus. On the 23rd, after very heavy rain on the night of the 22nd (wind S.S.W.), two male Blackcaps came into the garden;* at the same time a fine old male Whinchat was seen. On the 22nd also, nests of the Kestrel, Carrion Crow and Lapwing contained their full complement of eggs. After this gale and rain also unusually large numbers of Wheatears appeared in the coast marshes, males and females together, but the males, without exception, were still wearing their russet-brown mantles. The Cuckoo was seen and heard on the 25th; and the 30th—wind N.E. and still excessively cold—brought the common Whitethroat.

* I suspect the Blackcap nested in this parish last summer, for on the 3rd July I saw a female bird of this species in one of the plantations.

May came in with a bitter east wind. On the 1st the Sedge Warbler was heard and seen, and the 2nd brought Swallows, "not single spies, but in battalions." On this day I observed a flock of about fifty Knots on the foreshore, and could perceive no sign of any change of dress from the ordinary sober gray of winter. The House Martin came on the 6th, and on the 8th I saw a very considerable flock of Fieldfares; wind E.N.E. and very cold. The only Lesser Whitethroat seen by me this season was, on the 12th, actively engaged searching for food on the branch of a pear tree trained on the side of the house. I watched the little fellow for some minutes at the distance of only a few feet. On the 14th—wind north, dull and cold—the Spotted Flycatcher and Swift were seen. The Garden Warblers were unusually late, none being heard here before the 17th.

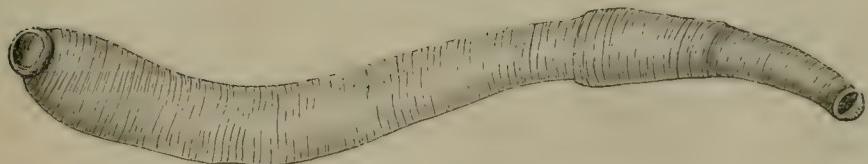
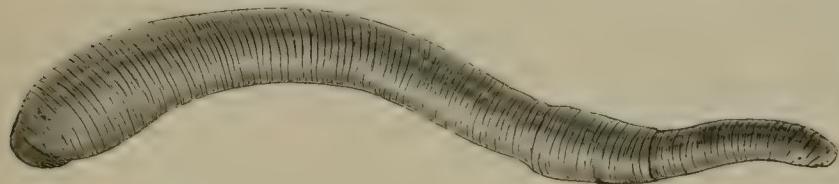
On May 26th I saw a pair of Turtle Doves perched together on a tree by the roadside near Riby, Colonel Tomline's Lincolnshire seat, a locality where they now regularly nest. On the 29th a flock of fifteen Turnstones were foraging amongst the bladder-wrack on the Humber embankment. Whimbrel never visited us in less numbers, and a small flock of eight were all I saw during the month.

The nest of a Sedge Warbler on June 2nd contained two eggs. The Reed Warblers, however, which I first found nesting in our north-east marsh district in 1876, only returned to their nesting haunts on the 14th June, at which time the autumn-mown reeds in the drains were sufficiently advanced to enable them to commence building.

I have commenced these notes with an extract from a letter of Mr. Gätke's. I will conclude them in the same manner. On June 5th he writes, "Two days ago an *Emberiza melanocephala*, a male of last autumn changing for summer dress *without* moult, was killed here, and is a very interesting catch."

ON THE OCCURRENCE IN ENGLAND OF DUTROCHET'S
LAND LEECH, *TROCHETIA SUBVIRIDIS*.

BY THE EDITOR.



IN the "Editor's Address," with which the first number of the present series of 'The Zoologist' commenced, allusion was made to the discovery, a few years ago, of the local occurrence in England of Dutrocheted's Land Leech, *Trochetia subviridis*. I had hoped that the remarks then made would have elicited from some correspondent an account of this little-known annelid, and of the circumstances under which it has come to be regarded as indigenous to this country. In this, however, I have been disappointed, and nearly a twelvemonth having elapsed without receipt of any communication (except a brief note from Dr. Murie), it occurs to me to offer the following remarks, in the hope that their perusal may elicit some information on a subject which certainly deserves further investigation, and upon which at present comparatively little is known.

Trochetia subriridis was first noticed by Dutrochet, in 1817, from specimens obtained near Chateau-Renaud, in the Department d'Indre et Loire, where it was stated at that time to be tolerably common.* He has described it as resembling a Leech in appearance, horizontally flattened like one, and similarly provided with a contractile disc at the posterior extremity; but differing from it in wanting the three teeth, with which leeches puncture the skin of their prey, and in possessing, on the anterior third of the body, an annular enlargement or swelling (*renflement*), analogous to what is seen in the common earthworm.

The length of this annelid varies considerably, individuals having been met with which measured from two to six inches.

The colour in general is greyish green, somewhat lighter beneath, as well as on the annular enlargement, while on the back are two longitudinal and parallel brown lines, scarcely noticeable at first, but which become more perceptible on immersion in alcohol, when the whole body, with the exception of these two lines, turns to a dull leaden colour above, and a pale clay-colour beneath. The late Dr. Baird, of the British Museum, on making this experiment with some British specimens, found that the colour left the leeches and imparted itself to the spirit, which became of a fine green hue.

The mouth is large and bilabiate, the upper lip being somewhat larger than the under one, and according to Dutrochet—and after him Lamarck†—there are neither teeth nor eyes. But upon the question of the presence or absence of teeth and eyes later authorities differ, as I shall presently point out.

The excretory orifice, which is large as compared with what obtains in the true leeches, is situated on the median dorsal line, a little above the posterior disc; the genital organs are placed beneath, in the middle of the annular enlargement.

But it is in its internal anatomy especially that this animal differs from the true leeches.

The alimentary system consists—1st, of a long smooth œsophagus, disposed in longitudinal folds; 2nd, a stomach of which the lining membrane is villous and of a greyish colour; 3rd, the intestine shorter than, and as large as, the stomach, with the lining membrane of a fine yellow colour, a valve separating it from the

* Dutrochet, "Note sur une Annélide d'un genre nouveau"; 'Bulletin des Sciences par la Société Philomathique de Paris,' 1817, p. 130.

† 'Hist. Nat. des Anim. sans Vertèbres,' 2nd. ed., 1838, vol. v., p. 522.

stomach which precedes it, and from the rectum which follows it; 4th, the rectum, of which the lining membrane is reddish, communicating with the excretory orifice.

The alimentary canal is quite straight. The heart, like the blood-vessels, is filled with red blood, and the annular swelling—in the middle of which the heart is situated—receives a great number of these vessels. This led Dutrochet to regard it as an organ of respiration, akin to lungs. He could discover no trace of those little pouches which, to the number of nine on each side, are found in the Medicinal Leech, *Hirudo medicinalis*.*

With regard to the habits of *Trocheta*, Dutrochet states that it does not live in the water, but on moist soil, where it pursues earthworms, on which it preys, and which it swallows piecemeal (*par tronçons*).† When placed in water he found that it died in three or four days—a statement, however, which has received some modification at the hands of later observers. On the whole Dutrochet considered that the annelid in question constitutes a genus intermediate between the Earthworms and the Leeches, but nearer to the latter than to the former.

The few authors who immediately succeeded Dutrochet in noticing this annelid, as Lamarck and De Blainville, apparently added little or nothing from their own observation to what had previously been made known concerning it. Lamarck corrected Dutrochet's generic name from *Trocheta* to *Trochetia*,‡ and after pointing out that the genus is distinguished from *Hirudo* by having the mouth bilabiate, and possessing neither teeth nor eyes, he gives the following salient characters:—"Body long, cylindrical, anteriorly larger, and somewhat flattened posteriorly, and

* Leeches have no special organ of respiration, the function being performed by the entire skin, and the organ in *Hirudo*, *Aulastoma* and *Hæmopis*, which Lamarck and others thought were two rows of respiratory pouches, and which are absent in *Trochetia*, are apparently only reservoirs of mucus, perhaps for lubricating the skin.

+ Other observers have remarked that, like *Aulastoma*, it swallows the worm whole. On examining one of two specimens which Professor Garrod found in the Regent's Park and kindly submitted to me, I drew from its mouth a portion of a small earthworm, which measured fully an inch in length.

‡ Agassiz, in his 'Nomenclator Zoologicus,' gives the derivation of this word as $\tau\varphi\chi\sigma\varsigma = discus$, a plausible but erroneous idea, for it is evident that the genus was intended to be named after its author, but the termination was incorrectly formed by him. Moquin Tandon, however, retains the original spelling, as also does Diessing, in his 'Systema Helminthum,' vol. i., p. 459 (1850), and Johnston, Cat. Brit. Non-parasitical Worms in Brit. Mus., p. 45 (1865).

terminated at the posterior extremity by a contractile disc. An encircling ring, large and slightly elevated, on the anterior third of the body. Mouth bilabiate, upper lip larger and obtuse. No teeth or jaws. No eyes. Anal aperture on the upper surface of the body, near the posterior disc."*

In the 'Dictionnaire des Sciences Naturelles,' vol. xlvii. (1827), under the heading "Sangsue," De Blainville has given (pp. 205—273) a very full account of the Leech family, dealing in detail with the anatomy, physiology, and natural history of all the species then known. He gives the length of the body in *Trochetia* (p. 244) as two or three inches, and describes the colour as green above, yellowish beneath, adding that the number of articulations in the body is very considerable. In the accompanying volume of plates† a figure of this species is given under the name *Geobdella Trochetii*, De Blainville.

But it is to the elaborate and more recently published work of Moquin Tandon ‡ that we must turn for fuller and more accurate information concerning this little-known annelid. In several important particulars he controverts the statements of his predecessors. For instance, in regard to the alleged non-existence of eyes, he says there are eight—not very apparent at first sight, he admits, but nevertheless discoverable on examination. Four are disposed anteriorly, in the form of a crescent, on the first segment, and four are ranged posteriorly on either side of the third segment in lateral and transverse lines. With regard to teeth, which it had been stated did not exist, M. Moquin Tandon discovered that there are three. To quote his words accurately, however, he designates them "jaws," § and thus describes them:—"Machoires, 3, égales, très petits, demiovales, très comprimées, sans denticules, tranchantes." These are figured on plate iv. of the atlas of plates, figs. 10 and 11; but the representation there given does not quite accord with the description in the text, the shape of the teeth as figured being sub-triangular and slightly hooked, rather than semi-oval. They are smaller and not serrated as in other genera.

The Rev. W. Houghton, who has paid some attention to the

* 'Hist. Nat. des Anim. sans Vertèbres,' 2nd ed., vol. v., p. 522.

† 'Planches; Vers et Zoophytes,' fig. 6.

‡ 'Monographie de la famille des Hirudinées;' nouvelle édition, revue et augmentée, accompagnée d'un Atlas de 14 planches gravées et coloriées. Paris, 1846.

§ So also Diessing (l.c.), "*maxillius internis tribus*." Dutrochet, referring to their presence in other leeches, calls them "tongues" (*langues*).

Leech family, failed to detect these teeth;* but, as Mr. Jabez Hogg has observed,† they are so exceedingly small, when compared with the size of the animal, that they can only be got out with some difficulty, and by a careful dissection. The parts then require to be soaked and prepared in the usual way for mounting in balsam, to render them sufficiently transparent for a power of 150 diameters and upwards. Referring to Moquin Tandon's figure, Mr. Hogg characterizes it as "very inferior; the mouth, jaws, and teeth very much more resembling those of the *Echini* than of the ordinary leech." "The teeth," he adds, "are placed in a triangular form and are hooked and very acute, for grasping and bruising."

Moquin Tandon's observations of *Trochetia* lead him to believe that it is only semi-terrestrial in its habits, for he succeeded in keeping specimens in water for a fortnight in good health. It is to be found, he says, in little rivulets and gutters in the fields, whence it comes forth occasionally to prey on earthworms, in pursuit of which it is almost as voracious as *Aulastoma*. ‡

In regard to its reproduction it is not hermaphrodite, as some leeches are said to be, but individuals of both sexes are found. The female is oviparous, and forms, in a moist tunnel in the ground, a small capsule or cocoon containing numerous ovules, from which the embryo leeches are usually hatched at the end of forty days. The young leech is white when first hatched, and does not begin to acquire colour until some hours afterwards. The perfect colouring is not attained for two years. Its first food consists of the mucous matters which cover the leaves of aquatic plants; afterwards, when its mouth has become more developed, it feeds on the larvæ of insects and other small animals. §

The colour of *Trochetia* seems to vary in individuals, the normal coloration being a dull greyish green, with two longitudinal dorsal stripes of a brownish shade. Moquin Tandon describes five other varieties under the names *rufescens*, *nigricans*, *brunnea*, *rubella*, and *carnea*, which sufficiently indicate their prevailing tints.

* 'Land and Water,' 13th March, 1869.

+ Id., 17th April, 1869.

‡ A species of Leech also semi-terrestrial in its habits, coming out of the water and hiding under stones on the margins of pools and ponds. It preys largely on worms, and can swallow one whole, seizing it by the middle and gulping it down with the two halves close together. It frequently, however, cuts them in pieces first.

§ See Fermond, "Sur la Conservation et la Réproduction des Sangsues," 'Comptes Rendus,' tome xxxii., p. 719; and Robin's important work, 'Sur le Dévelopement Embryogenique des Hirudinées,' 4to, Paris, 1875.

The localities for *Trochetia* named by Moquin Tandon are Chateau-Renaud (Indre et Loire), the neighbourhood of Toulouse, near St. Girons (Ariège), near Lanquais (Dordogne), and the environs of Algiers.

To these may now be added certain localities in England. In 1850 Mr. Hoffman found, in the neighbourhood of the Regent's Park, a large Leech, which the late Dr. Gray identified with the present species, and described as being new to the British fauna.* A few years later—namely, in July, 1865—Dr. Murie, while engaged on a *post mortem* examination of a Moluccan deer, which had died in the Gardens of the Zoological Society, found amongst the viscera a Leech of such dimensions as to excite the astonishment of those present. Unfortunately the viscera were somewhat disturbed and confused when the Leech was first observed, so that it was difficult to say whether it was attached to the stomach, to the intestines, or to the organs of the chest. It was at first supposed to be an unusually large Horse Leech, *Hæmopis sanguisuga*, which might have been accidentally swallowed by the deer while drinking; but upon further examination Dr. Murie came to the conclusion that it was *Trochetia subviridis*. In a communication on the subject which he subsequently made to the Zoological Society,† he expressed some doubt as to its being indigenous to the British Islands, and inclined to the belief that the specimen obtained might have been accidentally imported to this country by the medium of some large animal.

A few years later, when the acquisition of fresh specimens from a new locality gave rise to a renewed discussion on the subject in the Natural-History columns of 'Land and Water,' Mr. Henry Lee, who took a lively interest in the matter, and to whom naturalists are indebted for eliciting the facts in connection with the re-discovery of this Leech in England, published a letter‡ which he had received from the late Dr. Baird, of the British Museum, a well-known authority on *Annelides*, in which the following passage occurs:—"The specimen sent some few years ago by Mr. Bartlett from the Zoological Gardens is a true *Trochetia*;§ but the one

* 'Proceedings of the Zoological Society,' 1850, p. 52. This specimen is preserved in the British Museum, and is referred to in the 'Catalogue of Non-parasitical Worms,' 1865, p. 45, where it is stated to have been seven inches in length when fresh, and six inches after having been preserved in spirits.

† Proc. Zool. Soc., 1865, p. 659. ‡ 'Land and Water,' 13th March, 1869.

§ That is, Mr. Hoffman's specimen.

brought by Dr. Murie, which he described in the Zoological 'Proceedings' as *Trochetia subviridis*, is not a *Trochetia* at all, but must belong, from the structure of the oral, and especially the ventral, sucker, either to a peculiar species of *Hæmopis* or to a new genus not hitherto described. I thought at the time when Dr. Murie brought the specimen here that it might belong to the genus *Trochetia*, but now I find it does not."

Shortly before the date of this letter—namely, in February, 1869—several specimens of *Trochetia subviridis*, taken in the garden of Mr. Broadwood, at Lyne, between Dorking and Horsham, were forwarded by a friend of his—Mr. George Rooper, of Nascott House, Watford—to the Editor of 'Land and Water' for identification. In a note which accompanied the specimens, Mr. Rooper referred to them as "frequenting gravel walks and grass plots, on which—during the night principally—they seek their food, consisting, as far as I know, exclusively of their cousins the, earthworms. These they seize, and, as a general rule, without reference to their relative size, swallow whole. I am assured that a leech will swallow a worm *bigger* than itself! After their meal, like the snakes, they fall into a lethargic slumber, which lasts for days or weeks, until the two bodies are assimilated, to the manifest advantage of one—the leech."

To this letter, which was published, under the initials "G. R.," in the Natural-History columns of 'Land and Water' (20th February, 1869), Mr. Henry Lee appended a note in which he identified the species and pointed out some of its characters.

This announcement elicited an interesting communication from the Rev. W. Houghton,* to which reference has already been made, and a month later—namely, on the 20th March, 1869—there appeared in the same journal a letter from Mr. Broadwood, in which, after remarking that it was he who had supplied Mr. Rooper with the specimens forwarded to the Editor of 'Land and Water' for examination, stated that he had for many years observed these annelids on the lawn and paths of his garden, and that on the 18th of the previous month of January a young friend who had taken some specimens with him to Cambridge wrote to him that he had identified them with *Trochetia subviridis*.

It would appear from a note by the late Mr. Gedge (Assistant Demonstrator of Anatomy at Cambridge) published in 'The Annals

* See 'Land and Water,' 27th February, 1869.

and Magazine of Natural History' for May, 1869,* that the friend referred to by Mr. Broadwood was Mr. Marlborough Pryor, of Trinity College, Cambridge.

I have been thus careful to give the dates of the various communications on the subject which have been published, because there appeared to be some doubt as to whom the credit of rediscovering this annelid in England belonged.

The soil upon which the specimens in question were found is described by Mr. Broadwood as the hardest wealden clay, and though very deep, it is so close that every hole and crack holds water, and it is a long time before the rain becomes absorbed.

At a meeting of the Croydon Microscopical Club, held on the 16th November, 1870, the President, Mr. Henry Lee, announced his discovery, three weeks previously, of a new locality for *Trocheta subviridis*,—namely, on the Beddington Sewage-irrigation Farm of the town of Croydon,—and stated that he was informed that it was also to be found on the other irrigation-land belonging to that town at Norwood. He had found it “in about six inches of water at the bottom of the great ditch which conveys the Croydon sewage on to the estate before it flows over the land, and for three weeks it had lived and thriven in a bowl of water with two minnows.” Three months after this report,† it was still alive and in good condition, having been kept in water all the time in Mr. Woodward’s room at the British Museum.

Mr. Henry Lee was informed by another correspondent that he had heard of these leeches in Hants, and one of his own relatives assured him, in 1869, that at Lindsfield, in Sussex, about five and twenty years previously, Land Leeches were so abundant in the fields and on the footpaths through them, that the ladies of the family who resided there avoided them in their evening walks.

Mr. Marlborough Pryor has recently been good enough to inform me that in November, 1876, he found a specimen of *Trocheta subviridis* at Elstree, in Hertfordshire. As in the case of the Sussex specimens, it was found upon a stiff clay soil.

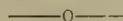
In conclusion, I may state that I have lately been favoured by Professor Garrod with two specimens of a Land Leech which, some months since, he found with some others on a moist foot-

* Ann. & Mag. Nat. Hist., 4th Series, vol. iii., p. 369.

† ‘First Report and Abstract of Proceedings of the Croydon Microscopical Club,’ 1871, pp. 22, 23.

path in the Zoological Society's Gardens, Regent's Park. These appear to me to possess all the characters assigned to the species now under consideration, although I have not yet had an opportunity of examining them under the microscope, and satisfactorily determining the presence or absence of teeth.

The occurrence, then, of this annelid in England having been placed beyond doubt, it is to be hoped that observers in different parts of the country will look out for it, investigate its habits, and forward for publication the results of their researches. Worms and leeches with most people are not especial favourites; but, under the present aspects of science, they are of more than usual interest, particularly as regards their habits and modes of development.



OCCASIONAL NOTES.

MR. WHARTON'S 'LIST OF BRITISH BIRDS.'—In 'The Zoologist' for October (pp. 458 seqq.) you published a review of my 'List of British Birds.' With your kind permission, I desire to make a few remarks in reply. In the first place, your reviewer finds difficulties in regard to Sundevall's system, which a reference to his 'Tentamen' would have easily dispelled; most of the objections that he raises are inseparable from a simply linear arrangement. But when objection is taken to my definition of a British bird, I must answer that I aimed at making, not a Census, but a List. It is not to such a mere enumeration as mine that a zoological geographer appeals when he wants to know what species are really indigenous or natural to any given country. But surely it does throw light on a fauna to have on record even the isolated occurrence of the most alien species, thus showing not only its resources as a metropolis, but also every form which it is capable of associating to itself. Your reviewer not unjustly dreads an undue multiplication of genera, but the retention of the Serin in the genus *Fringilla* is rendered impossible by the acceptance of Sundevall's method; he places the one in the family *Chloridiæ*, characterized among other particulars by the absence of vibrissæ, and the other in the family *Fringillidæ*, where the vibrissæ are evident. And surely the separation of *Helodromas* from the *Totani* requires no apology when, as pointed out by your reviewer, it depends upon an obvious osteological difference, which similarity of external circumstances shows no tendency to obliterate. The inconsistencies of terminations to which your reviewer alludes depend on a simple question of grammar. *Phoenicurus* and *rubecula* are substantives standing in apposition to their respective generic names;

arundinaceus and *streperus* are adjectives. The British form of *Parus ater*, L., and *Acredula caudata* (L.) I have not recognized, because in such a matter I am content to accept the conclusions of Professor Newton, as given in his revision of Yarrell's standard work. The authority of Brehm for *Regulus ignicapillus* rests on the statement of Temminck, in his 'Manuel' published in 1820. Jenyns certainly, in the work quoted by your reviewer, wrote "nob." after the name in 1835: but as he quotes Temminck's long previous usage of the same name, he was probably merely alluding to himself as having been the first to identify the bird in this country in 1832. On the testimony of Mr. Dresser ('Birds of Europe,' parts 47 and 48) and Professor Newton, Tunstall in 1771 did forestall Gmelin's description of *Falco peregrinus* in 1788. In 'The Ibis' for last July (p. 332) the reviewer will find that Mr. J. H. Gurney has satisfied himself that the two Spotted Eagles killed in Cornwall were both of them examples, not of *Aquila narva* (Gm.), but of *Aquila clanga* (Pallas). Mr. Howard Saunders has given satisfactory reasons (Proc. Zool. Soc. 1876) why the name *Sterna macrura*, Naumann, should take precedence of *Sterna hirundo*, L. In Mr. Dresser's 'Birds of Europe,' parts 59 and 60, it is shown that Brünnich's Guillemot cannot be called *Alca arra*, for under that name Pallas referred to a totally distinct species. In thus replying to the invitation of my reviewer, I cannot in courtesy conclude without expressing my thanks to him for pointing out the mistaken admission of *Ereunetes pusillus* (L.). The species should indeed rightly have appeared as *Tringa minutilla*, Vieillot (1819); for it may be observed that Wilson's name *pusilla* (1813) cannot stand, on account of its previous application by Linnaeus to a species since shown to be distinct.—HENRY T. WHARTON.

GREEN SANDPIPER IN THE CO. MAYO.—On the 30th September a Green Sandpiper appeared here, and took up its quarters at a little pool close to the shore. I made several unsuccessful attempts to shoot it; but, owing to its wildness, I was unable to do so until the 4th October. It proved to be a young bird, probably on its southward migration. The little pool is about thirty yards in length by six or eight in width, and is separated by a wall from the shores of the Estuary. On the other side it is surrounded by low trees, having a few yards of flat grassy bank between the water and trees. It appears to have some special attraction for Green Sandpipers, for the only birds of that species obtained or seen in this district were all observed at the same spot. The first Green Sandpiper I ever met with I shot there on the 12th January, 1866; and on the 25th August, 1873, my friend Mr. A. G. More saw a pair there, one of which he shot. The bird above mentioned as having been obtained on the 4th of last October makes the fourth seen here and the third specimen obtained. The extreme quickness of sight and wild flight are well and graphically described by Mr. Harvie Brown in his notice of the Green Sandpiper in Stirlingshire

(p. 441), and I can well imagine his difficulty in obtaining a fair shot when the bird was flying amongst trees after being disturbed or alarmed. Of all our waders the Spotted Redshank is the only one that at all equals the Green Sandpiper in quickness of sight, while it surpasses it in wildness of flight, as any one who has followed either bird along the shore can testify.—ROBERT WARREN (Moyview, Ballina, Co. Mayo).

HOPOE IN IRELAND.—It may interest some of your readers to learn that a Hoopoe was shot by Mr. Martin, of Knox's Street, Sligo, some time in September, as it rose from amongst the bent in the sand-hills of Sligo Bay.—ID.

SPOONBILLS AND CANADA GEESE IN SUFFOLK.—Two Spoonbills, both males, were shot at Aldborough on the 27th June, presumed to be of the same flock as that mentioned by me in 'The Zoologist' for August last (p. 343). On the same day four Canada Geese were seen at Harwich; on the day following one was shot at Aldborough, and a few days later one at Felixstow. Is it probable that these are the same Geese that are recorded in 'The Zoologist' for July (p. 300), as having been seen by Mr. A. B. Brooke at Butterstone Loch? It is singular that there were four in each case.—F. KERRY (Harwich).

SCAUP DUCK AT SCILLY.—Although we have had no weather to bring wild-fowl down west, and have not heard of any but a few scattered ones of our commoner species, Mr. Smith sent over the other day, for preservation, a good adult female specimen of the Scaup Duck from Scilly. The Scaup is a rare visitor with us, and its occurrence is worth noting.—E. H. RODD (Penzance, Nov. 3rd).

DEATH OF MR. ROBERT SWINHOE, F.R.S.—Our readers will hear with regret of the death, on October 28th, of Mr. Robert Swinhoe, F.R.S., late of Her Majesty's Consular Service in China. His name will be familiar to many as that of a naturalist who for several years past has devoted all his leisure time in investigating the Natural History, and more particularly the Ornithology, of China and parts of Japan, and in publishing through various channels the results of his researches. His earliest publication on the subject appeared in 'The Zoologist' for 1858, in which volume will be found (p. 6222) an article entitled "Remarks on the Fauna of Amoy." In successive volumes of this journal appeared other papers from his pen, on the small Chinese Lark, *Alauda calirox* (1859, p. 6723), on the Wild Swans of China (1860, p. 6923), and on the Birds of Amoy (1860, p. 7102). After this date his contributions to Ornithology appeared chiefly in 'The Ibis' and in the 'Proceedings of the Zoological Society,' to both of which publications he became a frequent contributor. In 1863 he published, in the 'Proceedings of the Zoological Society,' a "Catalogue of the Birds of China," and in the same journal his 'Revised Catalogue' appeared in 1871.

The latter publication, embodying numerous additions to the list of Chinese birds, and several new species which had been described by the author since the date of his first Catalogue, may be regarded as the most reliable source of information at the present time on the Ornithology of a country still very imperfectly known to European naturalists. In 1870 he contributed to the Natural-History columns of 'The Field' an interesting series of articles on the Natural History of Hainan. Mr. Swinhoe's official position in China enabled him from time to time to arrange for the capture and transmission to England of many rare and valuable animals for the Zoological Society's Gardens, and he never lost an opportunity of furthering the interests of the Society of which he was so distinguished a member. His successful efforts in regard to the importation of several rare species of *Phasianidae*, the most beautiful of all the game birds, may be especially called to mind. One of these, from the island of Formosa, has been described and named after him by Mr. Gould. It was much to be deplored that a naturalist of such talent and energy of mind was not equally gifted with physical strength to carry out his enthusiastic aspirations. Unfortunately, an attack of paralysis contracted in China necessitated his return to England, and for a considerable time before his death, his state of health was such as to cause great anxiety to his family and friends. His patience and cheerfulness while prostrated by this affliction were remarked by all who knew him, and it was fortunate for him that his favourite study furnished him with a constant occupation for the mind, which to some extent agreeably distracted his thoughts from his physical suffering. At the time of his death, Mr. Swinhoe had been for some time occupied in the preparation of a large work on the birds of China, which it was intended to illustrate with coloured plates. It will be a source of disappointment to ornithologists that he has not lived to complete it.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

November 1, 1877.—Prof. ALLMAN, President, in the chair.

Messrs. S. M. Samuel and P. Wyatt Squire were duly elected Fellows of the Society.

Two zoological papers were read. The first by Capt. William E. Armit, of Dunrobin, Queensland, was a "Note on Australian Finches of the Genus *Poëphila*." Mr. Gould having treated *P. Gouldiae* and *P. mirabilis* as distinct species, and Mr. Diggles having asserted his opinion that the former was the female of the latter, Capt. Armit procured specimens and investigated the habits and change of plumage of both, the result being

that he agrees with Mr. Gould that the birds in question are distinct and well-marked species.

The second paper was on Crustaceans, by Mr. E. J. Miers, of the British Museum—"A Revision of the *Hippidea*." The determination of the species of this small and peculiar group of Anomourous Crustacea, and their identification with the brief descriptions of the earlier authors, is both difficult and uncertain. Mr. Miers gave a *résumé* of the literature on the subject, and, in opposition to the views of the American naturalist, Mr. Dana, supported the older view of the affinities of the group. He remarked that, "Although in their elongated carapace and antennæ the *Hippidea* have a considerable resemblance to certain of the *Corystoidea*, as will be seen, *e.g.* by comparing the Chilian *Blepharopoda spinimana* and *Pseudocoryistes sicarius*, their true affinities are with the Oxystomatous *Brachyura*, through the *Raninidæ*. As regards their geographical distribution, they inhabit all the warmer temperature and tropical seas of the globe. Until recently little has been known of their life-history and habits, but Mr. S. I. Smith, of Connecticut, has lately furnished a detailed account of the development of the common species of the eastern shores of the United States. *H. talpoidea* lives gregariously, burrowing in the loose shifting sands near low-water mark. *Albunea Guérinii* and *Blepharopoda spinimana* have been obtained from deep water, the former in the Gulf of Algiers and the latter in the Bay of Valparaiso." Mr. Miers concluded by giving a descriptive list of the species of *Hippidea*, showing the geographical range of each.

A series of interesting botanical specimens were exhibited by different Fellows, and remarks made thereon:—Among others the late Mr. Hanbury's collection of Cardamoms, and a fungus in a sugar cane, by Mr. Holmes, of the Pharmaceutical Society; grape within grape, *i.e.*, adventitious fruit in place of seed, by Dr. Masters; Australian gum trees grown in this country, exhibited by Mr. Alfred O. Walker; and examples of the curious South American genus *Colletia*, by the Rev. T. H. Sotheby.

Two botanical papers were read:—One "On the Source of the Winged Cardamon of Nepal," by Dr. G. King; the other "On the Self-fertilization of Plants," by the Rev. G. Henslow, wherein the author arrives at conclusions opposed to those expressed by Mr. Charles Darwin in his well-known work on the subject.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

November 6, 1877.—A. GROTE, Esq., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the months of June, July, August and September, 1877.

A letter was read from Mr. R. Trimen, containing remarks on the African species of *Sarcidiornis*.

A letter was read from Mr. A. O. Hume, containing some remarks on Mr. Howard Saunders' recent paper on the *Sterninæ*.

The Secretary exhibited, on the part of Mr. G. Dawson Rowley, an egg of *Pauxis galeata*, laid by a black female bird of this species.

Prof. W. H. Flower read a paper entitled "A further Contribution to the knowledge of the existing Ziphioid Whales of the Genus *Mesoplodon*," containing a description of a skeleton and several skulls of Cetaceans of that genus from the seas of New Zealand.

A communication was read from Lieut.-Col. R. H. Beddome, containing the descriptions of three new species of reptiles from the Madras Presidency. It was proposed to call these *Oligodon travancoricum*, *Gymnodactylus Jeyporensis* and *Bufo travancoricus*.

A communication was read from the Marquis of Tweeddale, containing an account of a collection of birds made by Mr. A. H. Everett in the Island of Luzon, Philippines. Three new species were named *Megalurus ruficeps*, *Dicaeum xanthopygium* and *Oxycerca Everettii*.

Mr. D. G. Elliot read some remarks on *Felis tigrina* (Erx) and its synonymy, showing that *F. mitis* (F. Cuv.), and *F. macrura* (Pr. Max.), are identical with that species.

Prof. Garrod read a paper on some points in the visceral anatomy of the Rhinoceros of the Sunderbunds (*Rhinoceros sondaicus*).

A second communication from Prof. Garrod contained a note on an anatomical peculiarity in certain Storks.

Mr. Edgar A. Smith read a paper in which he described some shells from Lake Nyassa and a few marine species from the mouth of the Maeusi River, near Quilimane, on the East Coast of Africa.

A communication from Dr. O. Finsch contained the description of a new species of Petrel from the Fiji Islands, which it was proposed to name *Procellaria albicularis*.

A second communication from Dr. Finsch contained a report on the collections of birds made during the voyage of H.M.S. 'Challenger' at Tongatabu, the Fiji Islands, Api, New Hebrides, and Tahiti.

Mr. E. R. Alston read a supplementary note on Rodents and Marsupials from Duke-of-York Island and New Ireland. *Macropus lugens* (Alst.) was shown to be a synonym of *Halmaturus Brownii* (Ramsay), while Mr. Ramsay's *Mus echinoides* and *M. musarora* were respectively identical with *Mus Browni* and *Uromys rufescens* of Alston.

A communication from Mr. L. Taczanowski contained a supplementary list of birds collected in North-Western Peru by Messrs. Jelski and Stolzmann. Two species were new, and it was proposed to call them *Rallus cypereti* and *Penelope albipennis*.—P. L. SCLATER, Secretary.

